INTEGRATION

WIRELESS

DOCUMENTATION

IA MSC-UGSW3

802.15.4/ZigBee Wireless Protocol Analyzer (WPA)

User Guide

Version 1.0r - PRELIMINARY

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Integration Associates, Inc.
110 Pioneer Way, Unit L
Mountain View, California 94041

Tel: 650.969.4100
Fax: 650.969.4582
www.integration.com
marketing@integration.com
wireless.support@integration.com

802.15.4/ZigBee Wireless Protocol Analyzer (WPA)
Version 1.0r - Preliminary
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SAFETY INFORMATION

All safety information must be read carefully and fully understood, before attempting to use your 802.15.4/ZigBee USB Dongle.

This manual contains the safety information that must be observed in order to avoid potential hazards that could result in personal injuries or damage your 802.15.4/ZigBee USB Dongle.

802.15.4/ZIGBEE USB DONGLE

Warning: This product contains no user serviceable parts. Never remove the covers or dismantle the 802.15.4/ZigBee USB Dongle. Contact an authorised Integration service provider if repair or adjustment is necessary.

Caution: To avoid damage to this product never allow any liquids to spill into any part of the product, and never expose the product to rain or to water. If any of those events occurs switch off the product immediately. Contact an authorised Integration service provider for assistance before attempting to use the product again.

Never place this product on top of or adjacent to a heating device, and never expose it to direct sunlight. Never store in an unventilated room or vehicle where excessive internal temperatures may be encountered.

If the product is ever dropped and damaged, or you detect emission of extraordinary odour or excessive heat, switch off the product immediately. Contact an authorised Integration service provider for assistance before attempting to use the product again.

If this product is exposed to cold temperature, allow it to warm to room temperature before use. This will prevent the occurrence of harmful condensation within the product.

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1. INTRODUCTION

WELCOME TO THE WIRELESS PROTOCOL ANALYZER

Congratulations on your purchase of this quality Integration product. This manual explains how to install and use the Wireless Protocol Analyzer with the 802.15.4/ZigBee USB Dongle.

With the Integration 802.15.4/ZigBee USB Dongle it is possible to easily verify multi-vendor IEEE 802.15.4 and ZigBee networks. The 802.15.4/ZigBee USB Dongle is dedicated hardware that monitors the radio channel and performs a complete packet breakdown to a user interface running on a PC.

Due to the large quantities of display data such a device can potentially generate, the software includes a full filtering and rules wizard. Other features such as the channel scan feature makes configuring the unit a simple task.

Features:

- Real-time 802.15.4 packet 'sniffer'
- Transmission Quality Management
- Sub microsecond timestamps

System Benefits:

- Fully 802.15.4 compliant
- Graphical Protocol Analyser
- Essential tool for application Debug

WHAT'S REQUIRED

- 802.15.4/ZigBee USB Dongle
- CD-ROM comprising of:
  - USB Drivers
  - Application software
  - User Manual (PDF format)

If damage has occurred please advise your carrier and your supplier who will arrange appropriate action.

If it is necessary to re-pack the product for onward shipping or return to Integration for service PLEASE ENSURE THAT THE ORIGINAL PACKING OR EQUIVALENT IS USED.

2. INSTALLATION

SYSTEM REQUIREMENTS

Before you begin installation of the software and hardware you need to ensure that your system meets the requirements shown below.

Operating System

Your system should come with a pre-installed operating system or you may choose to upgrade your operating system to the latest version. Below you will find a list of those that the 802.15.4/ZigBee USB Dongle software supports. Check to make sure that you have the following minimum operating system:

- Microsoft Windows XP Home © or Windows XP Professional ©

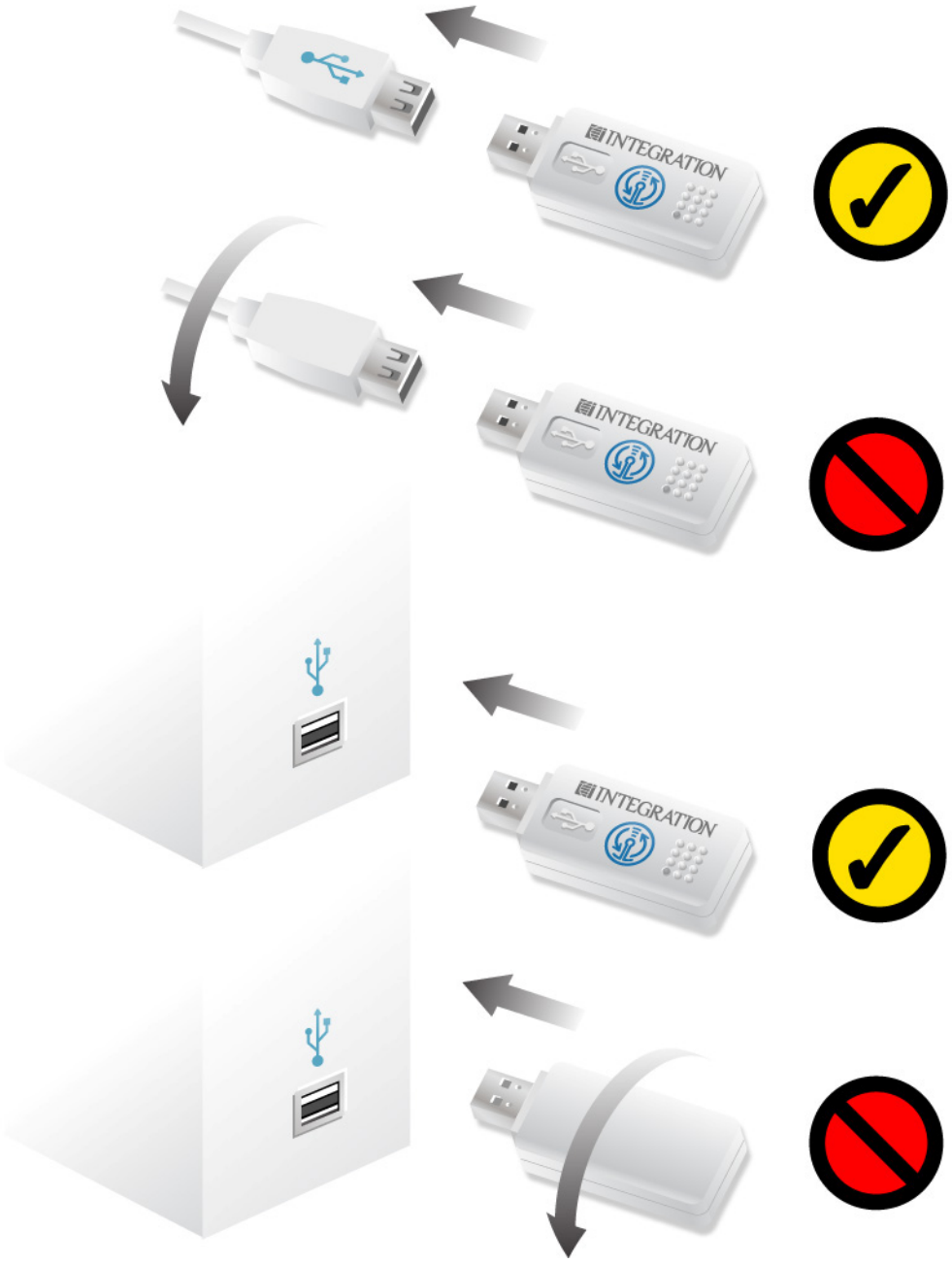
Hardware

Before you install the software, make sure your computer has the following minimum hardware requirements:

- Personal Computer with 300 MHz minimum processor, 2 GHz processor (Recommended). Please refer to the PC manuals that came with your system for system configuration information
- Minimum of 128MB, 256 MB RAM memory (Recommended)
- 200 MB of free hard drive space
- CD-ROM drive
- 1024x768 Graphics display
- Qty 1: 1.1 or 2.0 USB Compliant Port

SETTING UP THE HARDWARE

The 802.15.4/ZigBee USB Dongle unit can be considered a plug and play device since all that is required is a USB port on your computer. Installing the 802.15.4/ZigBee USB Dongle is simple; either connect directly to the USB port or via a USB extension cable to the USB port as shown below.



SETTING UP THE SOFTWARE

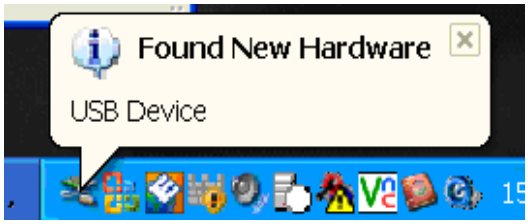
The CD-ROM supplied with your 802.15.4/ZigBee USB Dongle unit contains the following software: -

- USB Drivers
- 802.15.4/ZigBee USB Dongle Installation Application Software
- Microsoft.NET Framework ©
- 802.15.4/ZigBee USB Dongle User Manual (PDF format)

IMPORTANT NOTE: *In order to run the 802.15.4/ZigBee USB Dongle application, Microsoft .Net framework has to be installed onto the host system.*

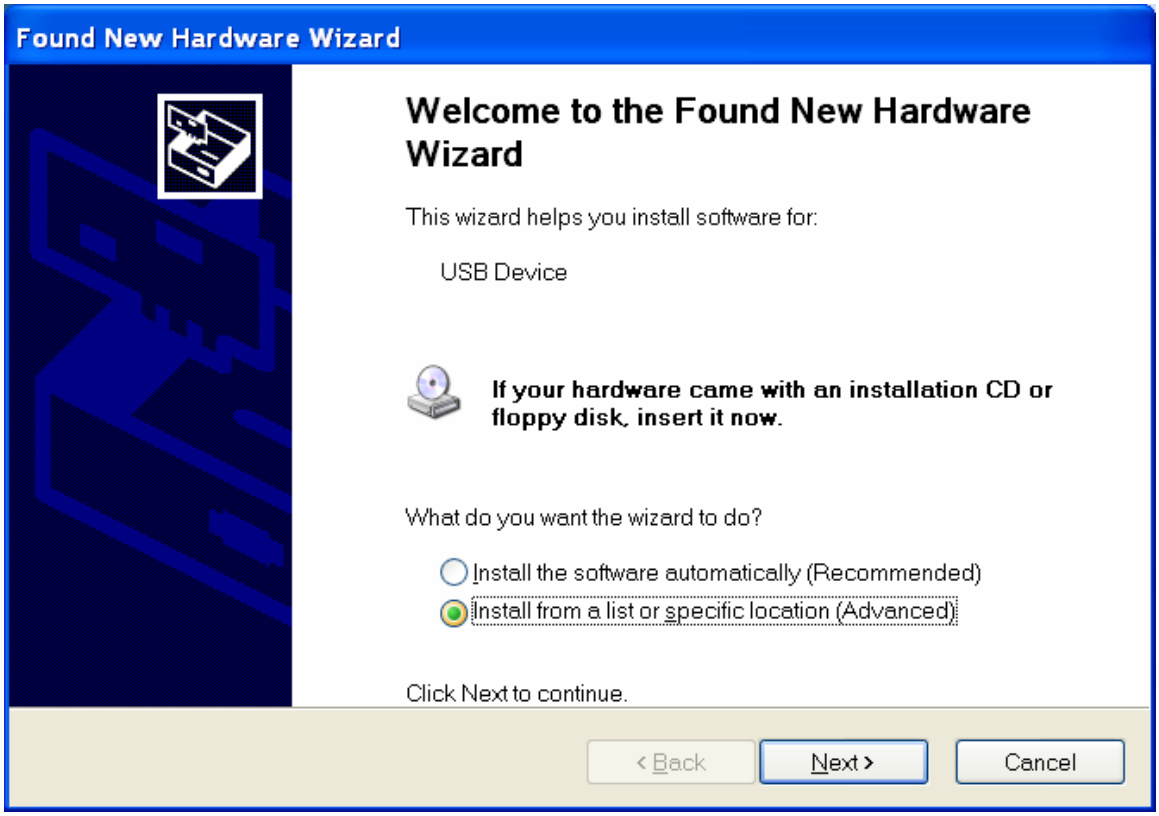
Installing the 802.15.4/ZigBee USB Dongle Drivers

Insert the USB Dongle to a USB port, or hub connected to a PC. Microsoft Windows will recognise a new device has been connected to the computer's USB port and the following window will appear.



The new Hardware wizard will appear. Click "**No, not this time**" then click "**Next**" to proceed

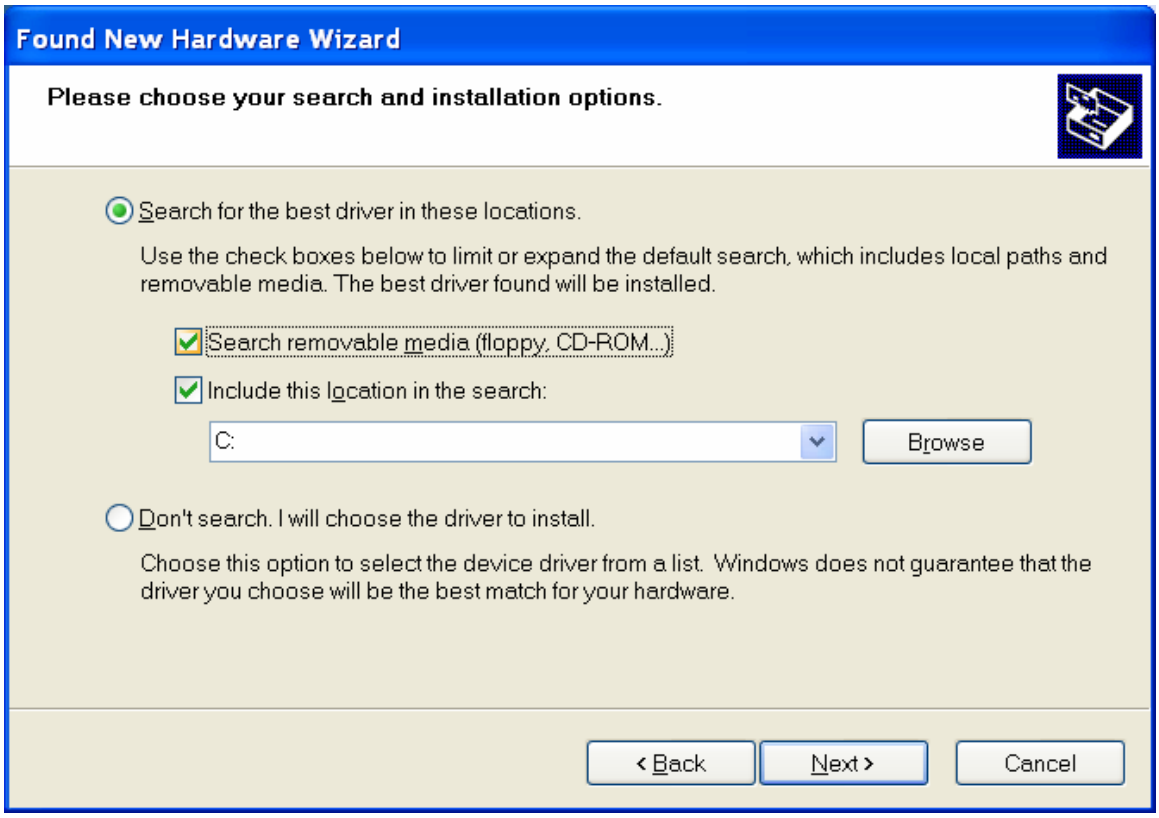
Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel


Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
USB Device
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

Select and click on the "**Install from a list or specific location**" radio button.

Click the **Next** button to proceed.

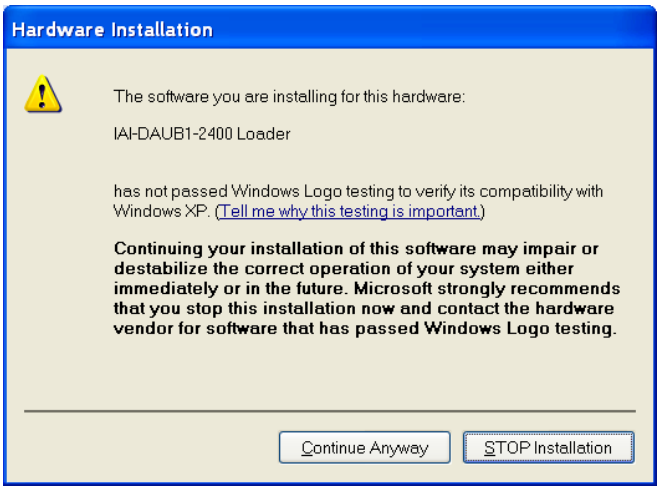
The wizard will now help you to install the 802.15.4/ZigBee USB Dongle drivers. The window below is displayed next, select the "**search removable media (floppy CD- ROM…)**" tick box. Ensure the supplied CD-ROM is installed in the CD-ROM Drive.


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
C:
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

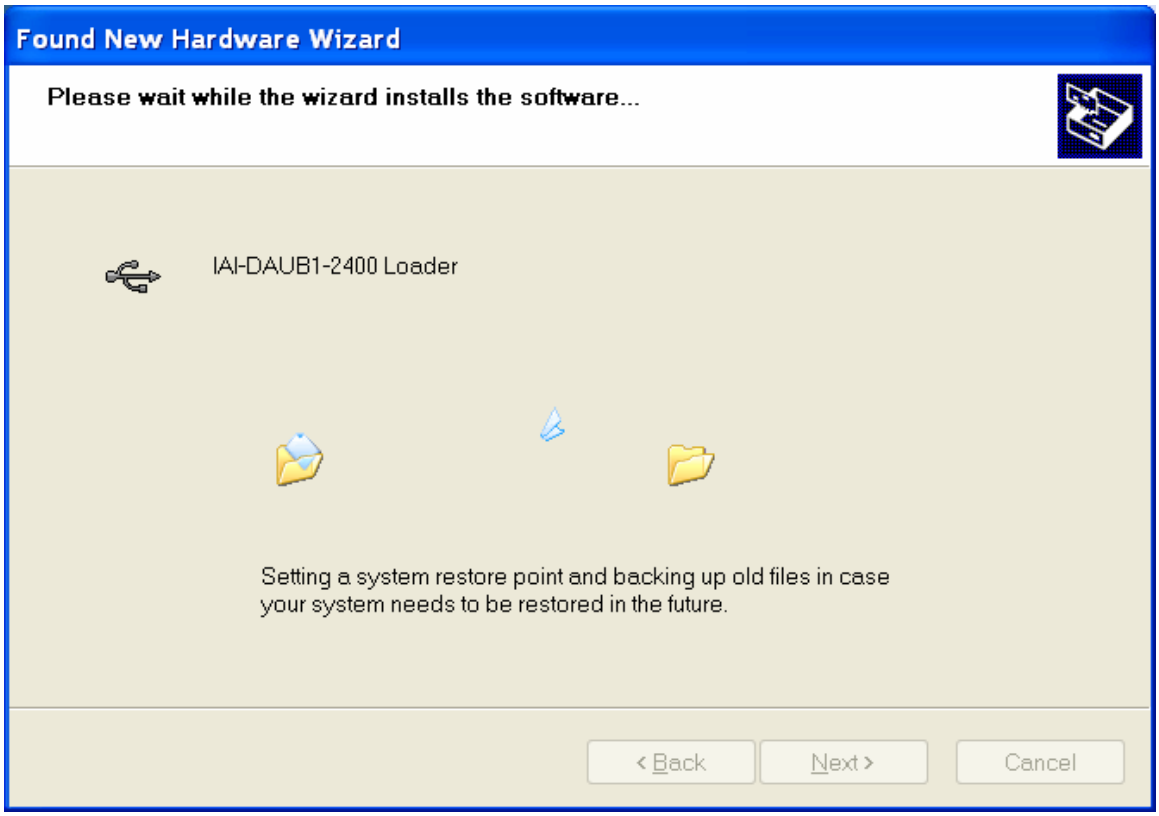
Click the **Next** button to proceed.

IMPORTANT NOTE: *The window shown below will be displayed, this is normal.*

Click the "**Continue Anyway**" button to proceed.

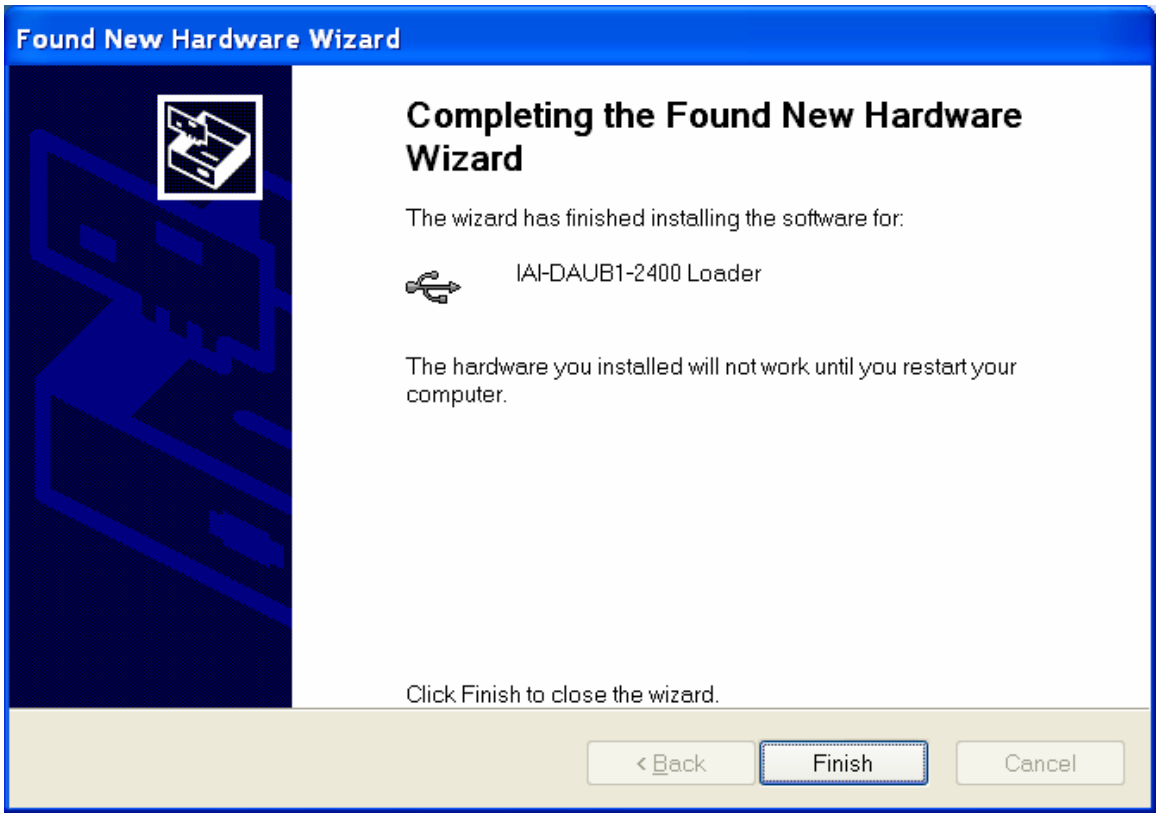

Hardware Installation
The software you are installing for this hardware:
IAI-DAUB1-2400 Loader
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

Please wait whilst the window below shows...


Found New Hardware Wizard
Please wait while the wizard installs the software...
IAI-DAUB1-2400 Loader
Setting a system restore point and backing up old files in case your system needs to be restored in the future.
< Back
Next >
Cancel

This window is displayed whilst the wizard installs the 802.15.4/ZigBee USB Dongle drivers onto your computer.

The drivers have been successfully installed when the window below is displayed.

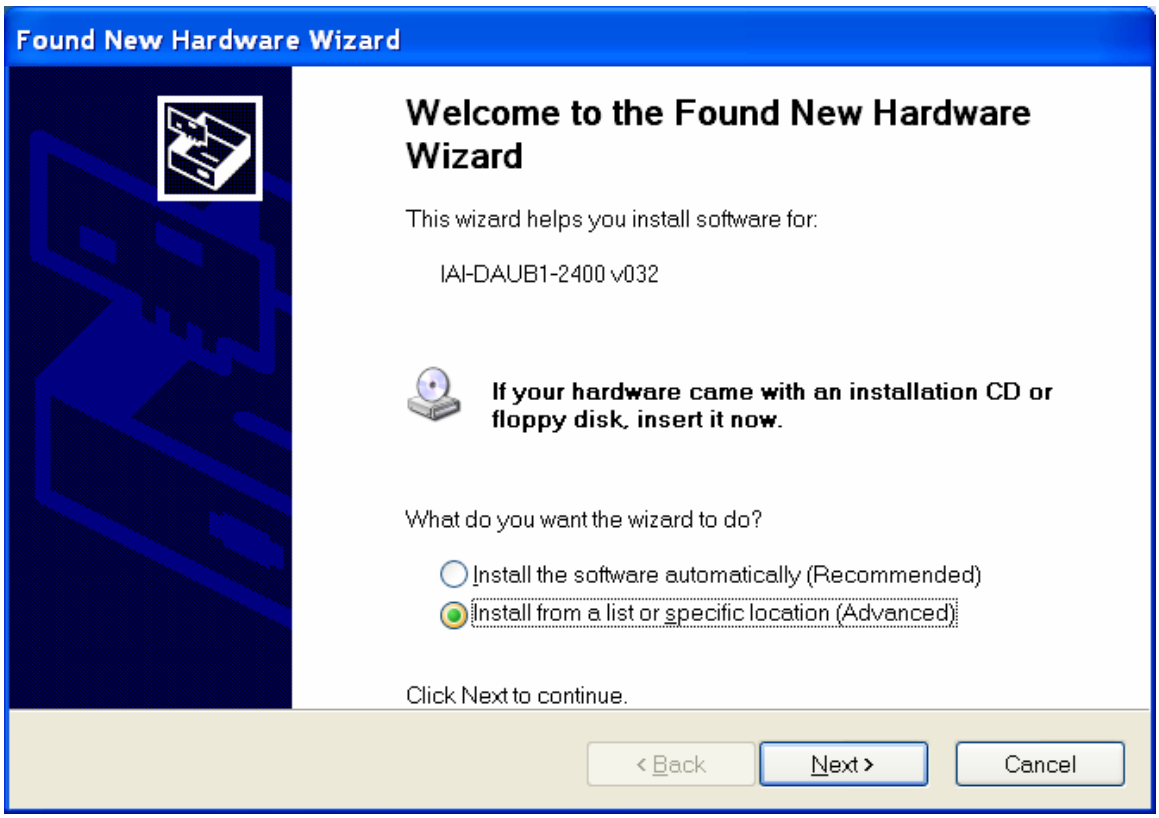

Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
IAI-DAUB1-2400 Loader
The hardware you installed will not work until you restart your computer.
Click Finish to close the wizard.
< Back
Finish
Cancel

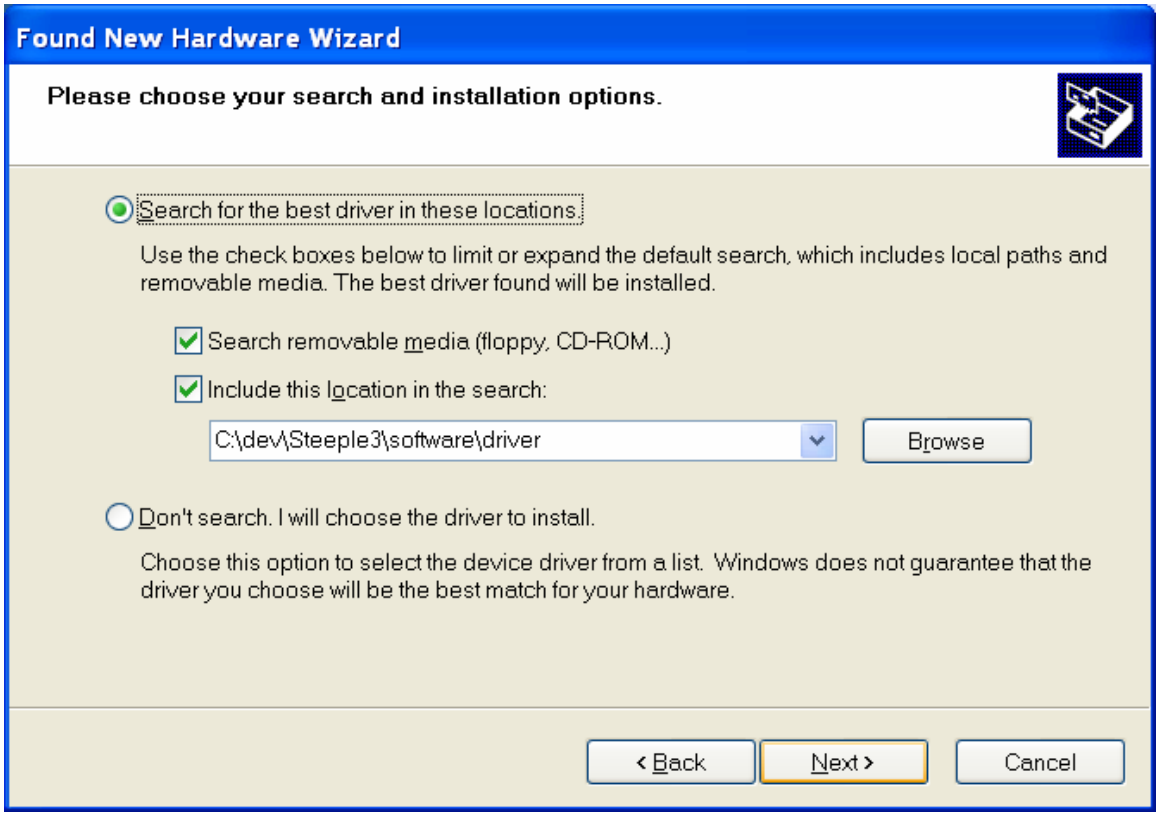
Click the **Finish** button to close the wizard.

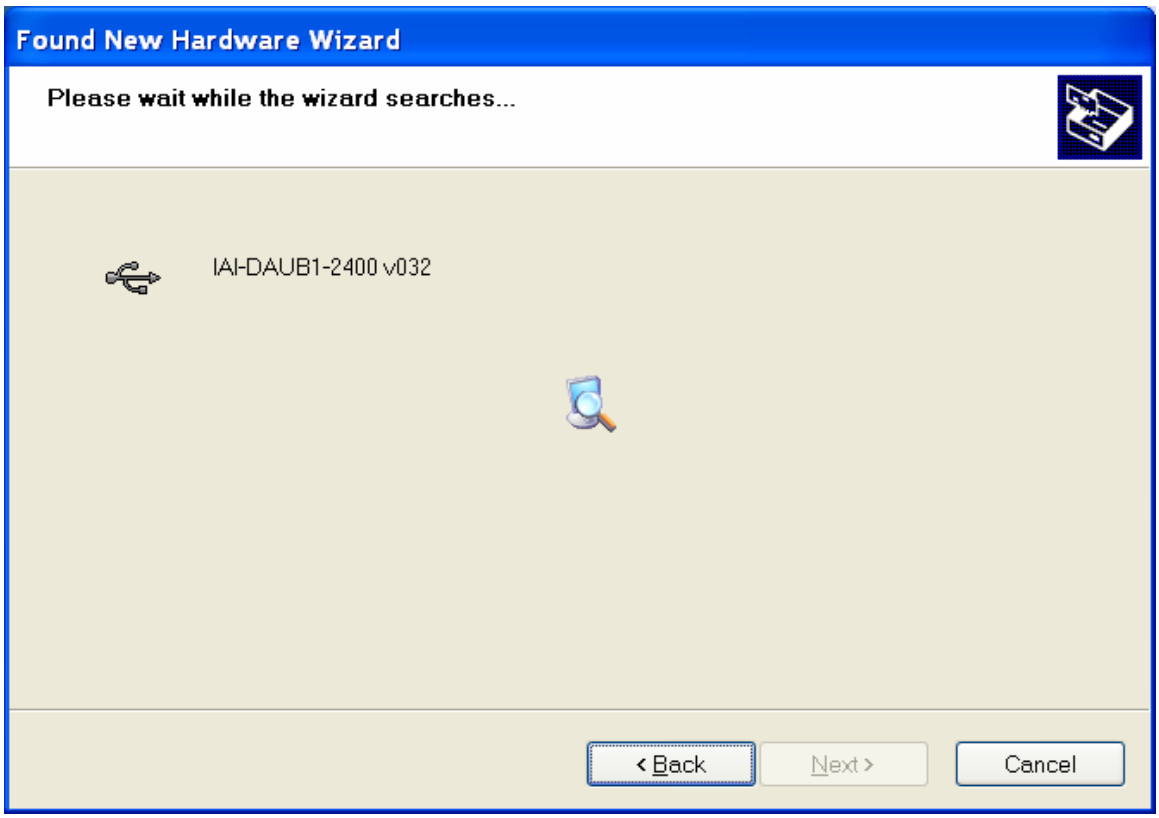
The secondary installation continues next

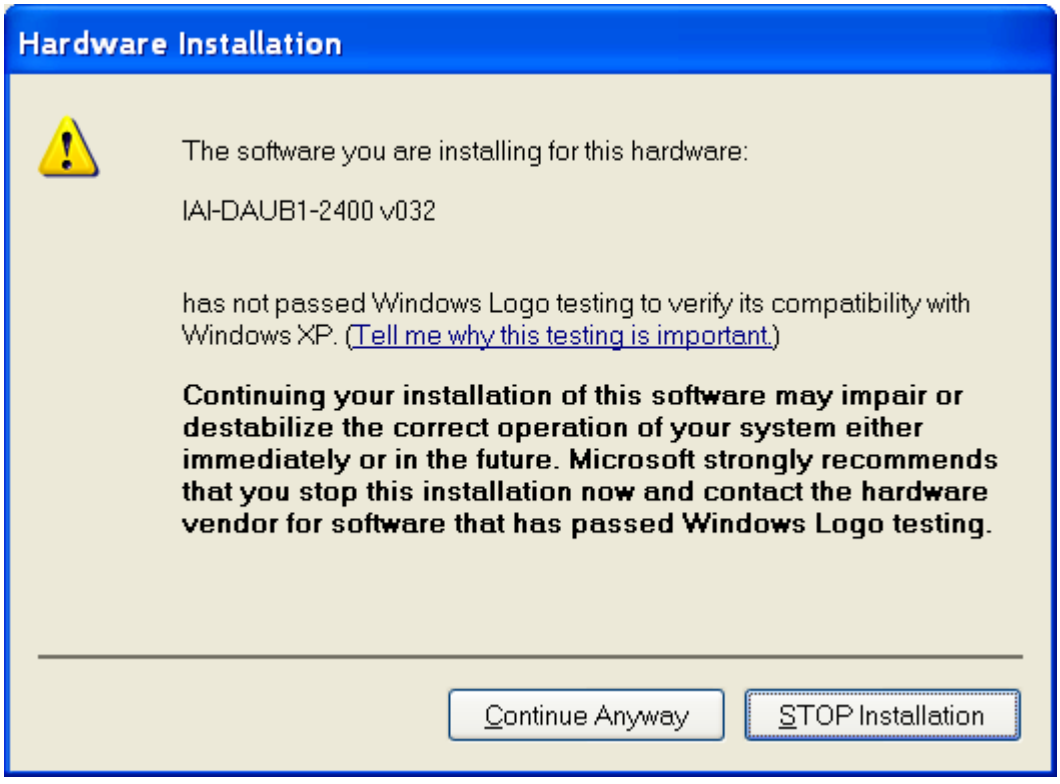
The new Hardware wizard will appear. Click "**No, not this time**" then click "**next**" to proceed

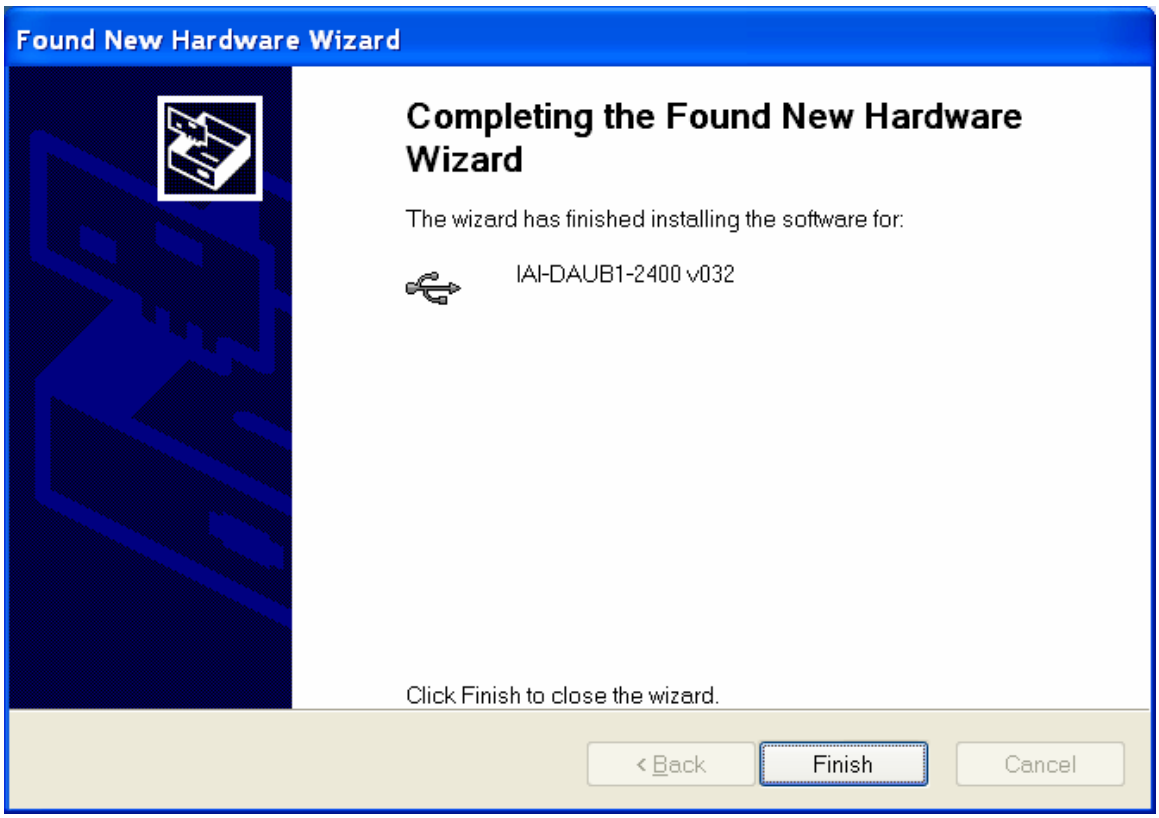
Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel


Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
IAI-DAUB1-2400 v032
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
C:\dev\Steeple3\software\driver
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel


Found New Hardware Wizard
Please wait while the wizard searches...
IAI-DAUB1-2400 v032
< Back
Next >
Cancel


Hardware Installation
The software you are installing for this hardware:
IAI-DAUB1-2400 v032
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

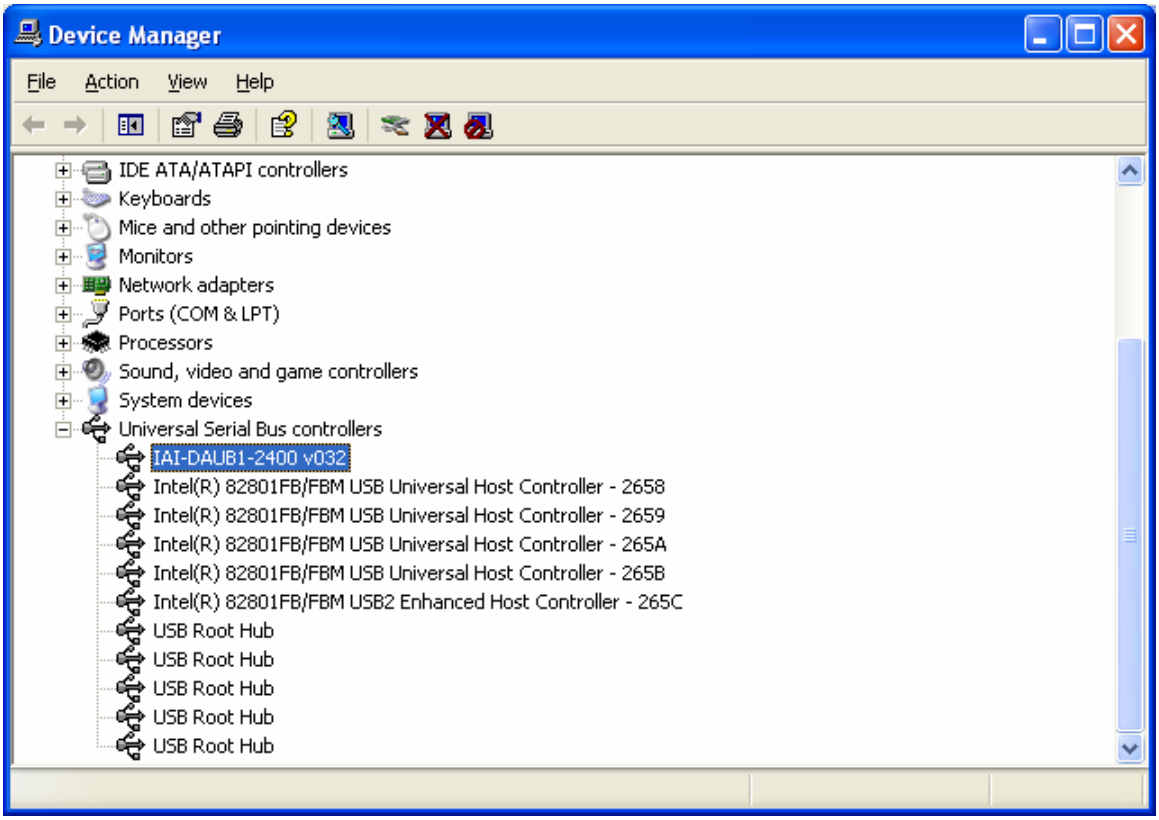

Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
IAI-DAUB1-2400 v032
Click Finish to close the wizard.
< Back
Finish
Cancel

Verifying Drivers Installation

After installation is complete, you may check the driver components are installed on your computer via the Windows Device Manager as follows:

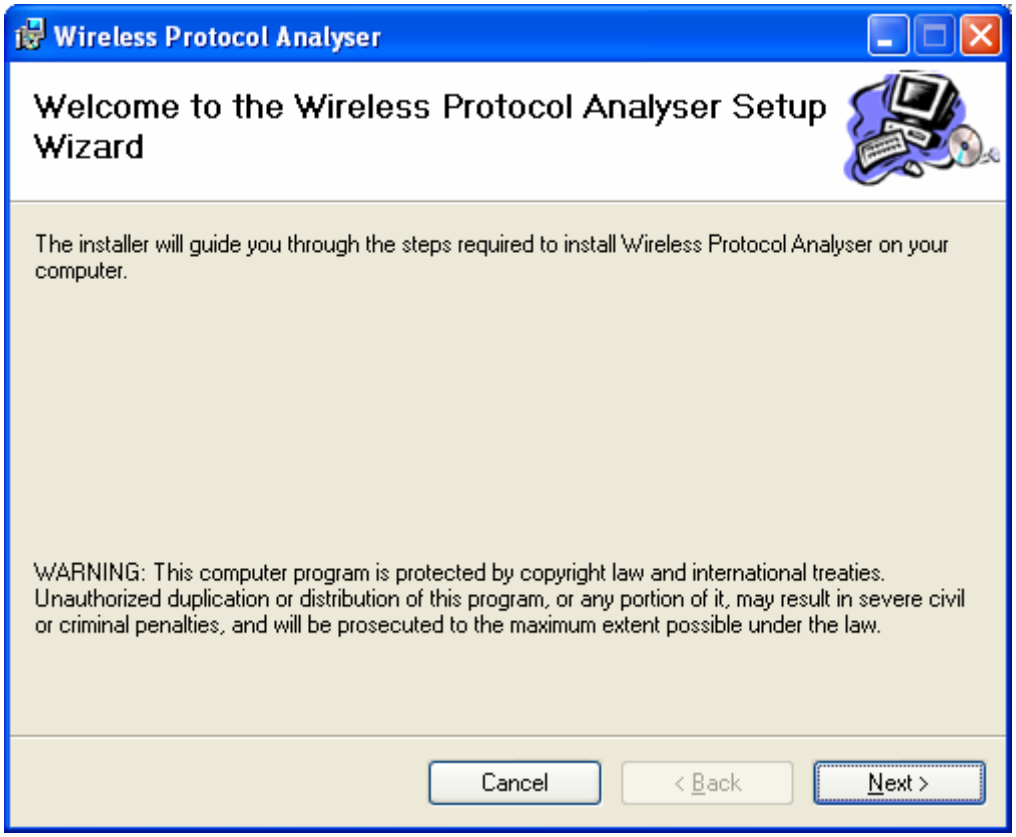
- From the Windows desktop select **Start**, right click on **My Computer**.
- Select **Properties**.
- Select the **Hardware Tab** and click on the **Device Manager** button.
- In the Device Manager window navigate to the **Universal Serial Bus Controllers**. Click the (+) sign adjacent to the "Universal Serial Bus Controllers" heading. You will find a new entry added to the list of devices, which appears as **IAI-DAUB1 2400 v032**

Below is an example Device Manager window with the driver components installed, shown highlighted.



Installing the 802.15.4/ZigBee USB Dongle Application Software

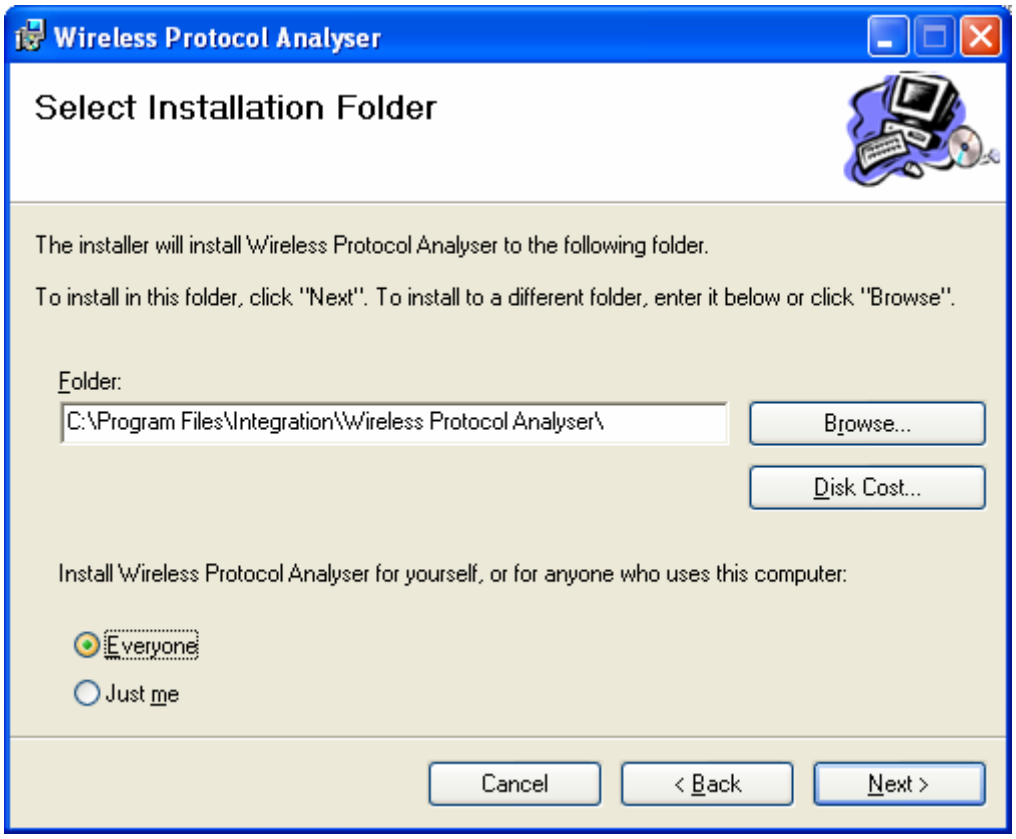
After installing Microsoft framework, on the supplied CD-ROM locate the 802.15.4/ZigBee USB Dongle installation program (file named USBSteeple.msi), and double click on this file, you should be presented with the following setup wizard screen.


Wireless Protocol Analyser
Welcome to the Wireless Protocol Analyser Setup Wizard
The installer will guide you through the steps required to install Wireless Protocol Analyser on your computer.
WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.
Cancel
< Back
Next >

Click the **Next** button to proceed.

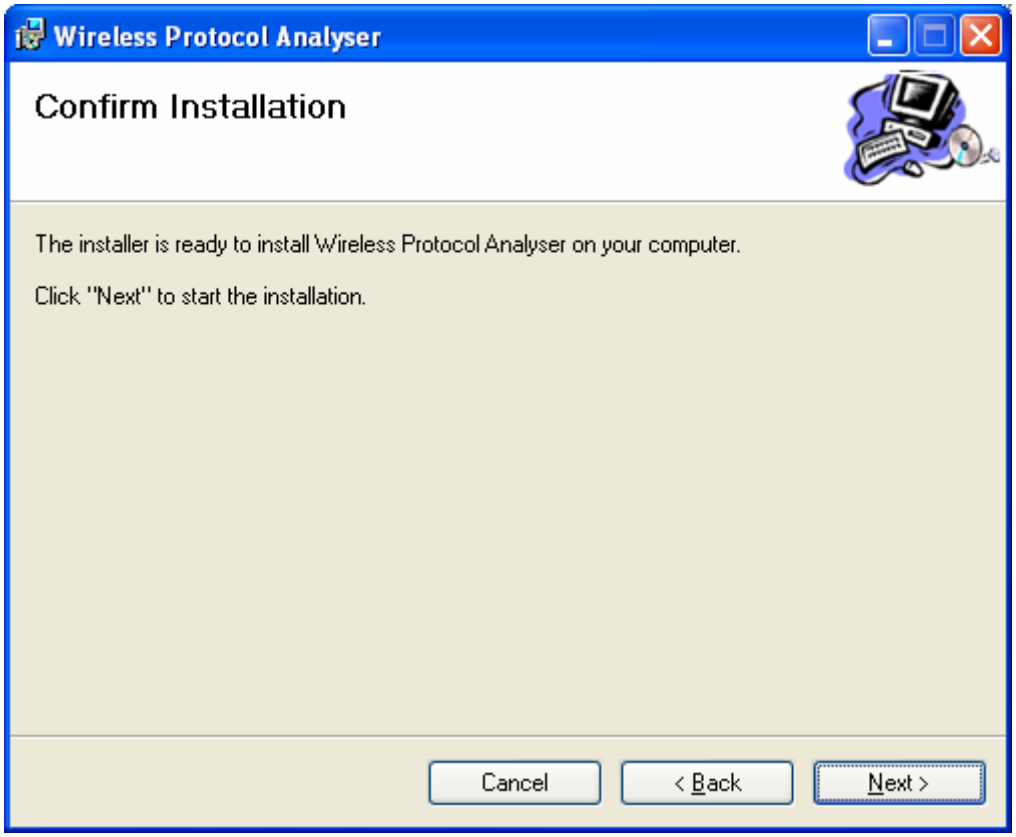
You will be presented with the following dialogue box.

In this window you have an option of where you want the wizard to install your copy of 802.15.4/ZigBee USB Dongle.


Wireless Protocol Analyser
Select Installation Folder
The installer will install Wireless Protocol Analyser to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Folder:
C:\Program Files\Integration\Wireless Protocol Analyser\
Browse...
Disk Cost...
Install Wireless Protocol Analyser for yourself, or for anyone who uses this computer:
Everyone
Just me
Cancel
< Back
Next >

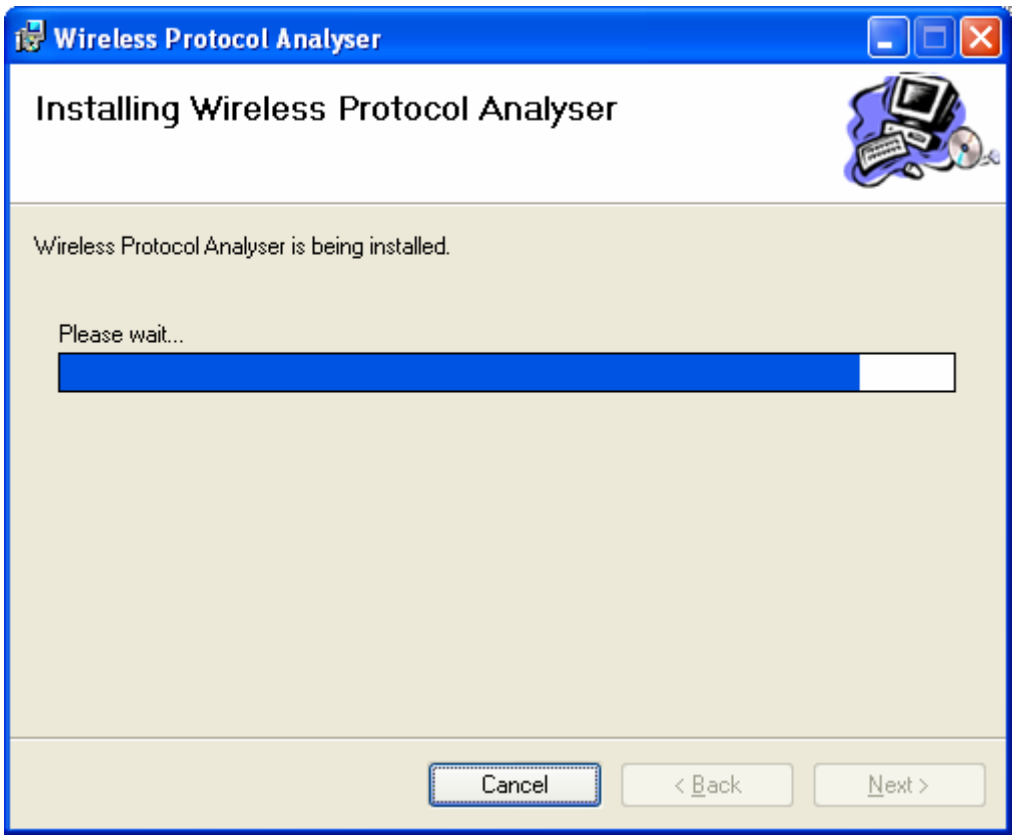
Use the browse button if you decide to change the default path.

Another option is the radio button controls, which give you the option to have everyone who uses the host computer to have access to the 802.15.4/ZigBee USB Dongle application or not.

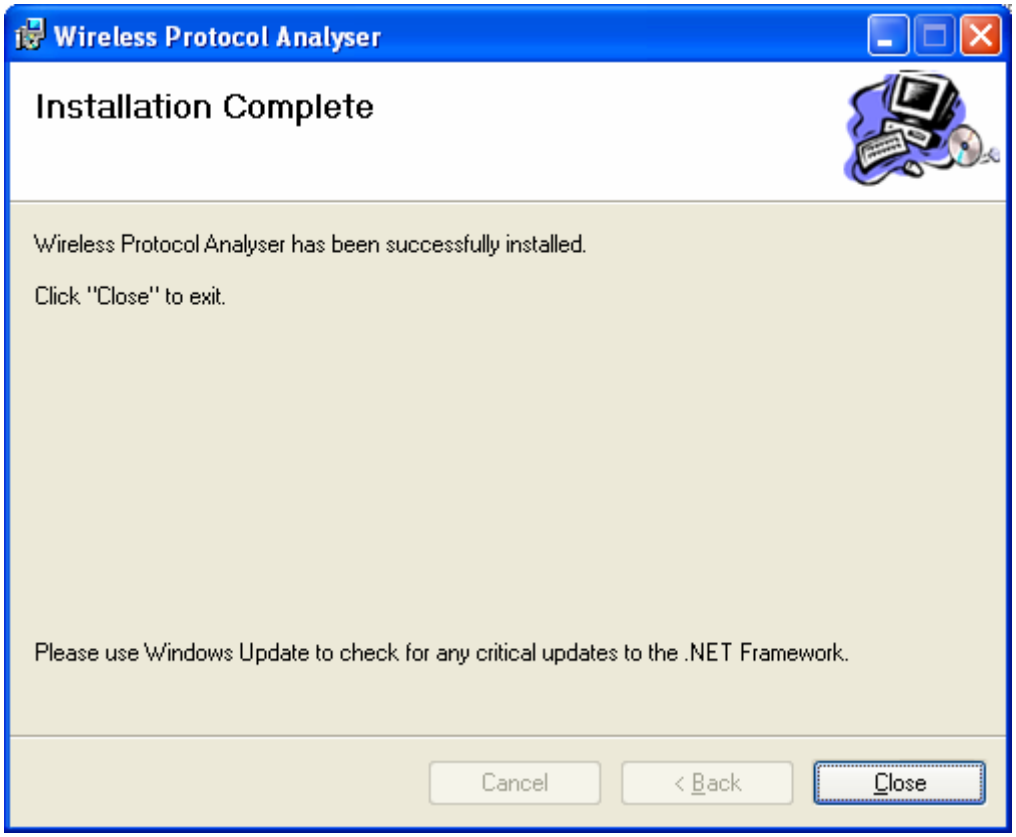

Wireless Protocol Analyser
Confirm Installation
The installer is ready to install Wireless Protocol Analyser on your computer.
Click "Next" to start the installation.
Cancel
< Back
Next >

Click **Next** button to use the default settings, and you will be presented with the dialogue box opposite.

Click the **Next** button to proceed with the installation.



During installation the dialogue box opposite will be displayed, the progress bar informs you of the installation process status.


Wireless Protocol Analyser
Installation Complete
Wireless Protocol Analyser has been successfully installed.
Click "Close" to exit.
Please use Windows Update to check for any critical updates to the .NET Framework.
Cancel
< Back
Close

After a successful installation the following dialogue will be presented informing you of your setup status.

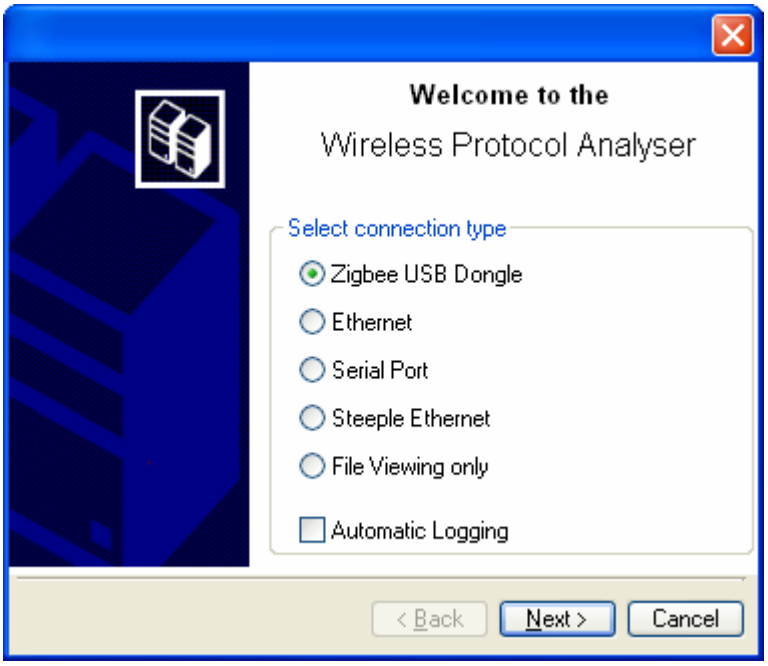
Click the **Close** button to exit.

Un-installing 802.15.4/ZigBee USB Dongle Application Software

To un-install 802.15.4/ZigBee USB Dongle application software select your windows application software control panel and select **Add/Remove Programs**. Refer to your windows application software manual for full details on how to remove programs from your computer.

3. USING WIRELESS PROTOCOL ANALYSER (WPA)

WPA NORMAL OPERATION



802.15.4/ZigBee USB Dongle Welcome and Wizard Window

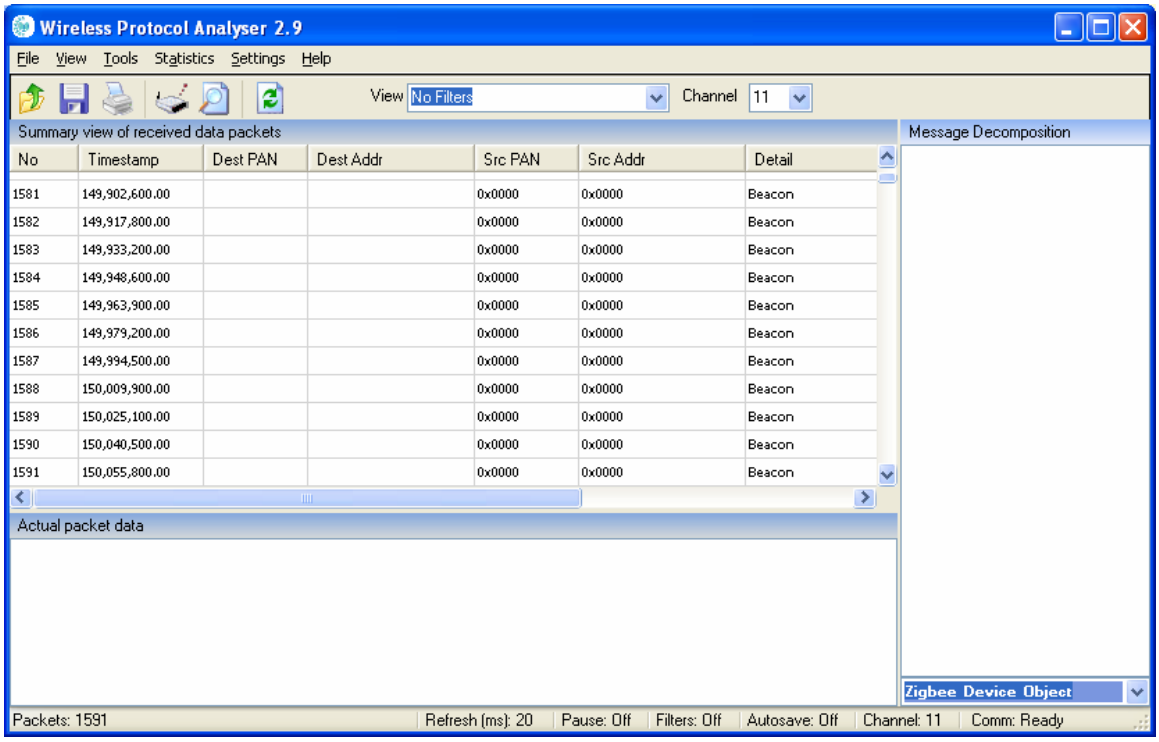
Launch the 802.15.4/ZigBee USB Dongle program from the windows desktop, click **Start** | **All Programs** | **Integration** | **WPA**

The wizard window opposite will now be displayed.

Select the **Connect to ZigBee USB Dongle** option and the wizard will attempt to connect to the installed 802.15.4/ZigBee USB Dongle device.

Click the **Next** button.

On successful connection the main window will be displayed, if data is being transmitted on the default channel of your 802.15.4/ZigBee USB Dongle, data will be captured and displayed. The window below shows a 802.15.4/ZigBee USB Dongle unit capturing packets of data that have been transmitted on channel 11.

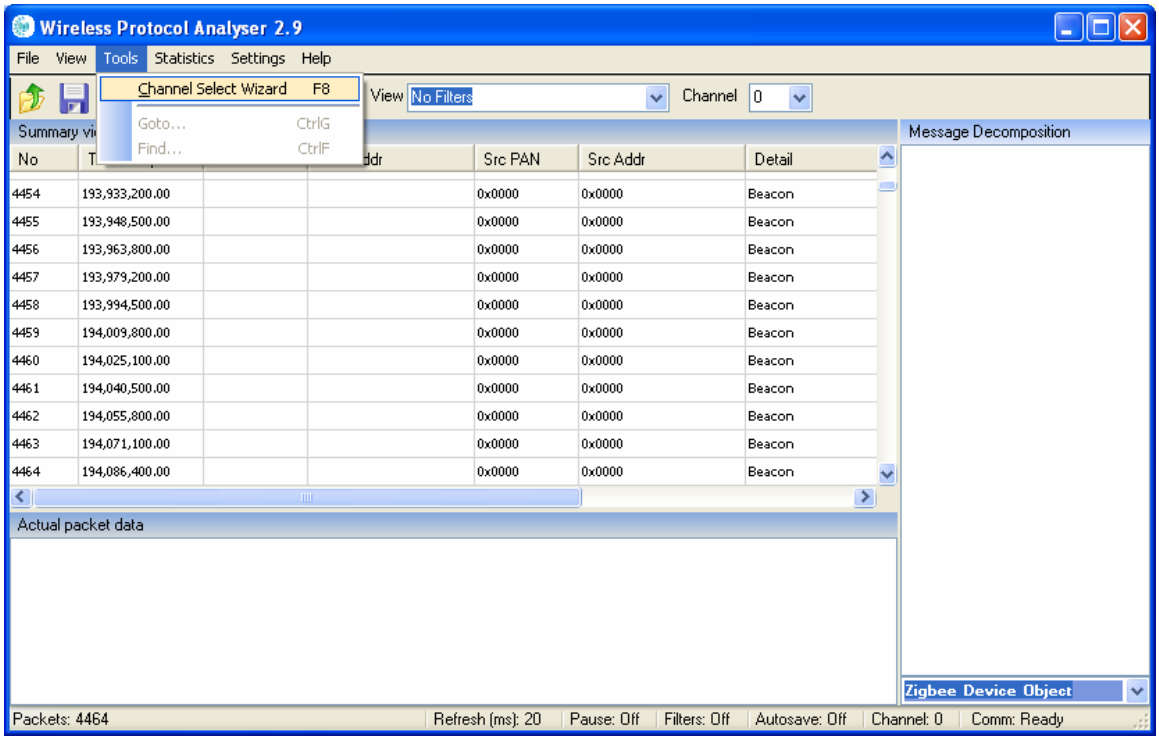

Wireless Protocol Analyser 2.9
File View Tools Statistics Settings Help
View No Filters
Channel 11
Summary view of received data packets
Message Decomposition
No Timestamp Dest PAN Dest Addr Src PAN Src Addr Detail
1581 149,902,600.00 0x0000 0x0000 Beacon
1582 149,917,800.00 0x0000 0x0000 Beacon
1583 149,933,200.00 0x0000 0x0000 Beacon
1584 149,948,600.00 0x0000 0x0000 Beacon
1585 149,963,900.00 0x0000 0x0000 Beacon
1586 149,979,200.00 0x0000 0x0000 Beacon
1587 149,994,500.00 0x0000 0x0000 Beacon
1588 150,009,900.00 0x0000 0x0000 Beacon
1589 150,025,100.00 0x0000 0x0000 Beacon
1590 150,040,500.00 0x0000 0x0000 Beacon
1591 150,055,800.00 0x0000 0x0000 Beacon
Actual packet data
Zigbee Device Object
Packets: 1591 Refresh (ms): 20 Pause: Off Filters: Off Autosave: Off Channel: 11 Comm: Ready

802.15.4/ZigBee USB Dongle Main Window

Selecting a Channel

Before WPA can capture any packet, the channel, which the network is using, has to be selected. This is achieved by using the Channel Select Wizard.

Select **Tools** | **Channels Select Wizard** menu as shown in the window below.



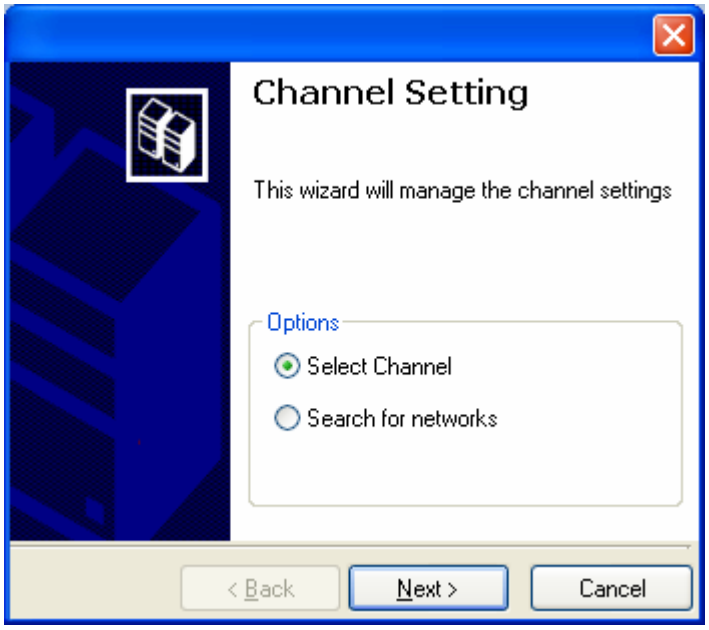
802.15.4/ZigBee USB Dongle Main Window

Click on the **Channel Select Wizard** dropdown menu option.

The window shown opposite will be presented.

Select the **Select Channel** option if not selected.

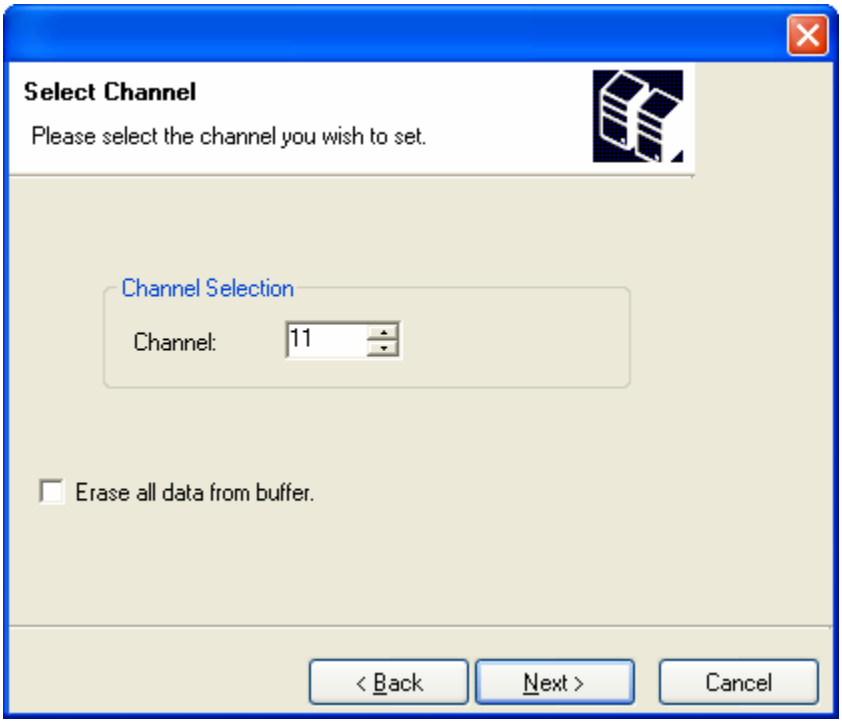
Click the **Next** button.



802.15.4/ZigBee USB Dongle Channel Select Wizard

The window opposite will be presented.

Using the spin control select the channel that your device is transmitting on and click the **Next** button.

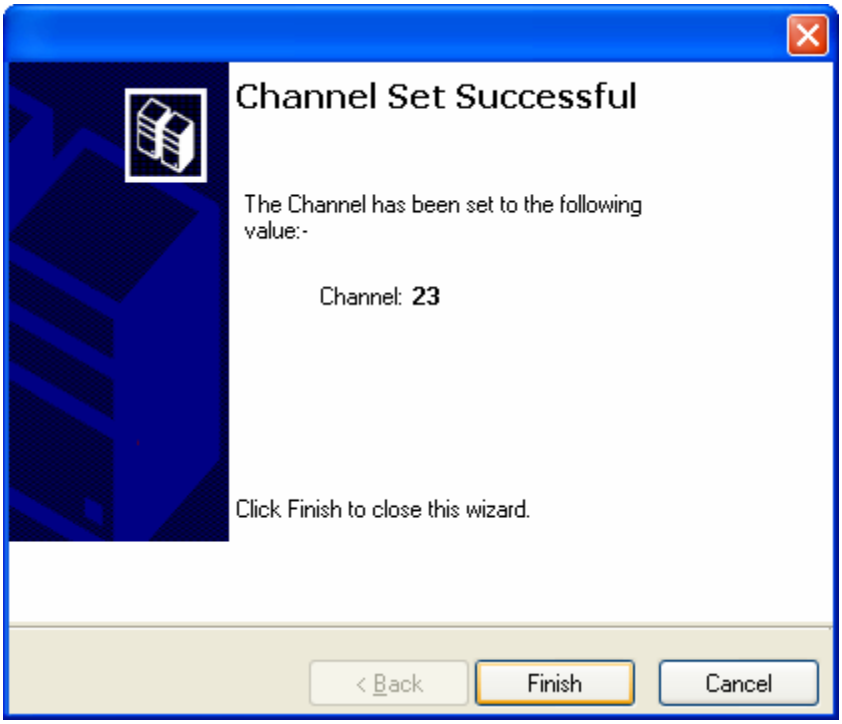


802.15.4/ZigBee USB Dongle Channel Select Wizard

.

The window opposite will be presented to confirm your selected channel.

Click the **Finish** button and your 802.15.4/ZigBee USB Dongle unit is ready to sniff any transmitted packets.



802.15.4/ZigBee USB Dongle Channel Select Wizard

NOTE: *If there is a device already transmitting on the selected channel 802.15.4/ZigBee USB Dongle will start sniffing immediately after pressing the finish button.*

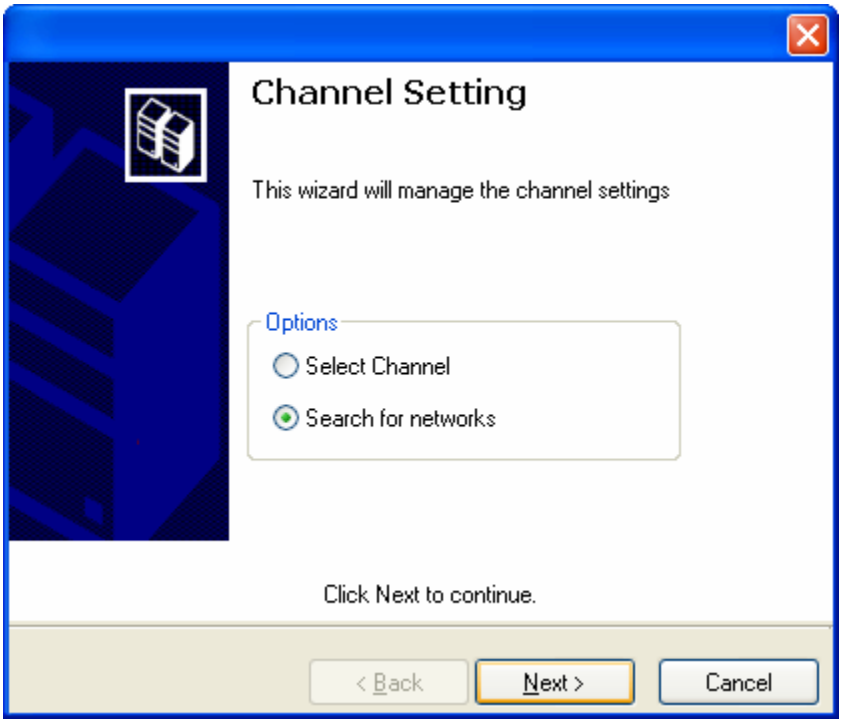
Scanning for Existing Networks

This option allows you to scan for existing networks.

From the main window, click **Tools | Channel Select Wizard.**

Select the **Search for Networks** option as shown opposite.

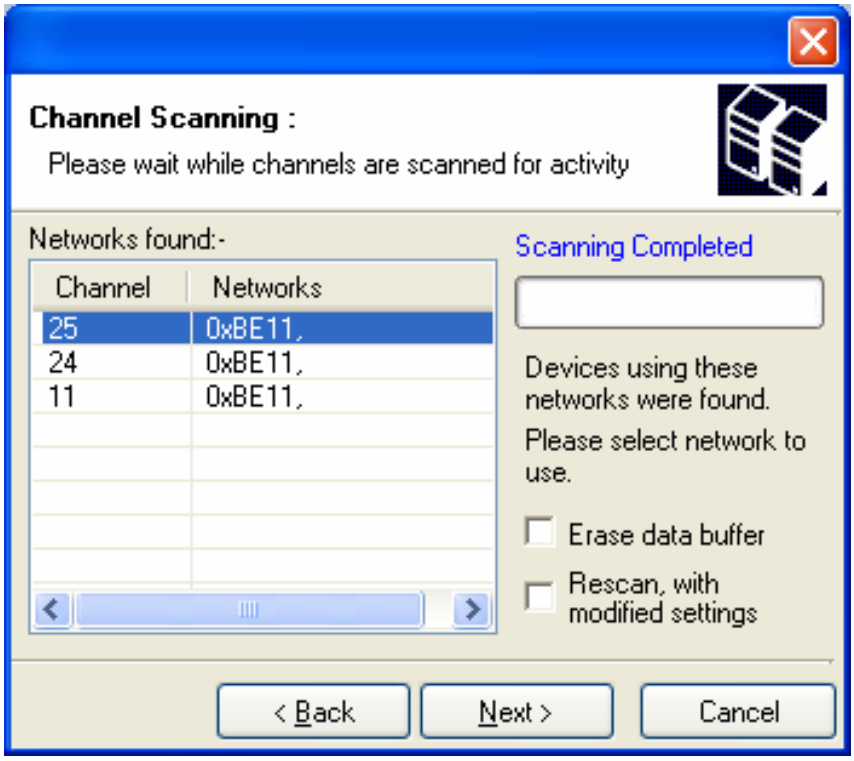
Click the **Next** button.



802.15.4/ZigBee USB Dongle Channel Select Wizard

The Channel Scanning dialogue opposite will be presented.

If any network is found this will be listed under Networks found, shown opposite. Select the desired channel and click the **Next** button.

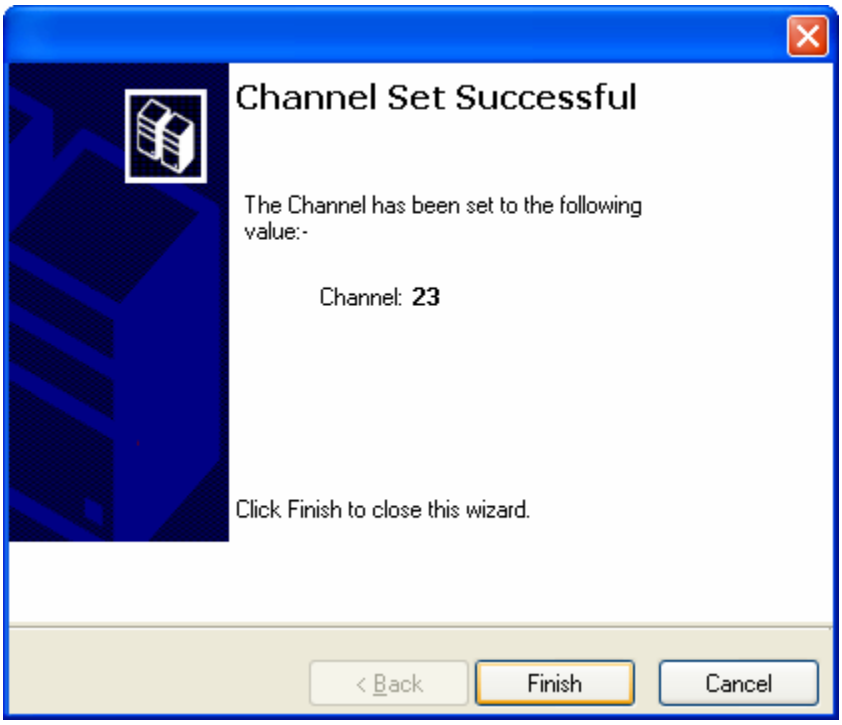


802.15.4/ZigBee USB Dongle Channel Select Wizard

***NOTE**: This function commands the 802.15.4/ZigBee USB Dongle unit to scan for all available channels, i.e., channels 11 through to channel 26.*

Click the **Finish** button.

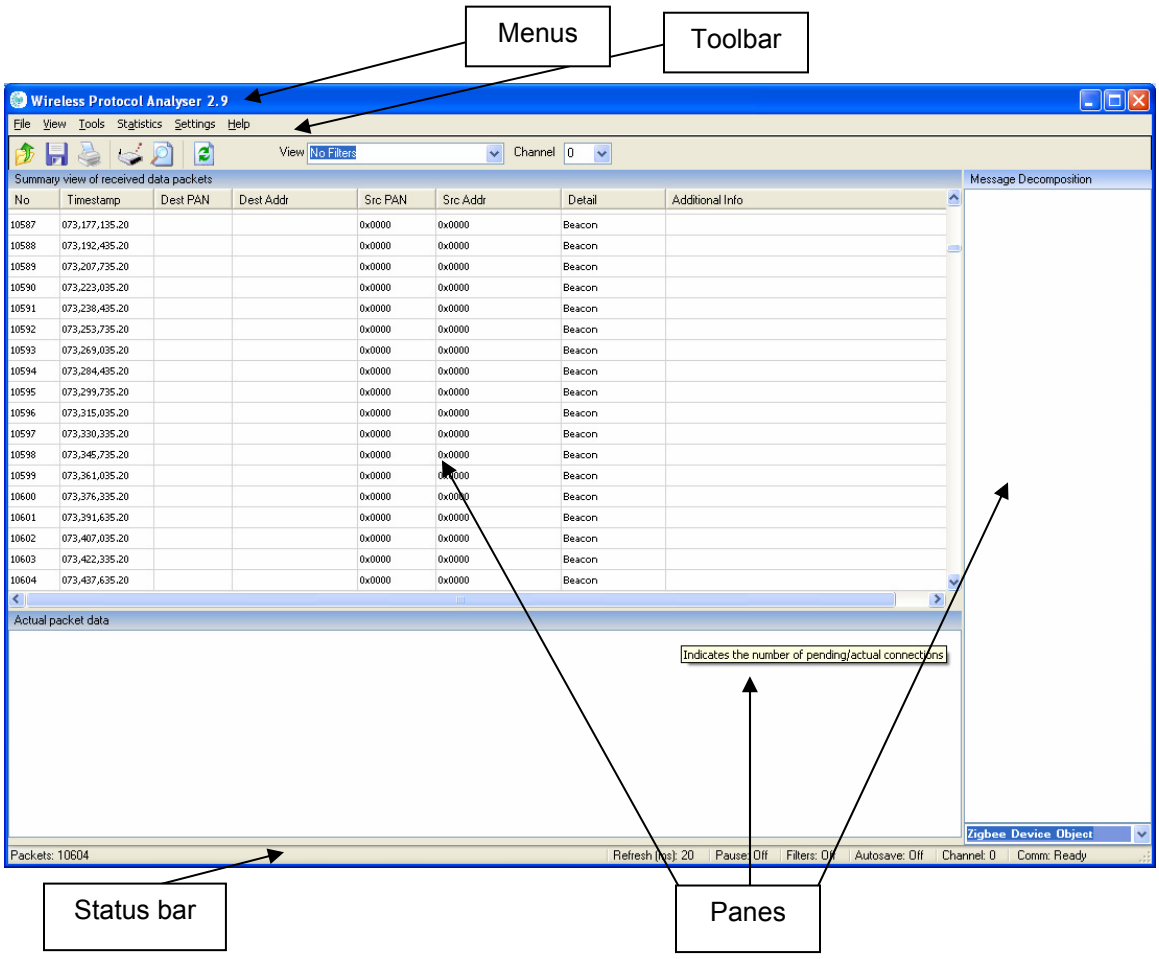
802.15.4/ZigBee USB Dongle will now start snooping on the selected channel



802.15.4/ZigBee USB Dongle Channel Select Wizard

802.15.4/ZIGBEE USB DONGLE MAIN WINDOW TOUR

This section explains how the 802.15.4/ZigBee USB Dongle main window is organised and its controls and components.



802.15.4/ZigBee USB Dongle Main Window

Dropdown Menus Bar

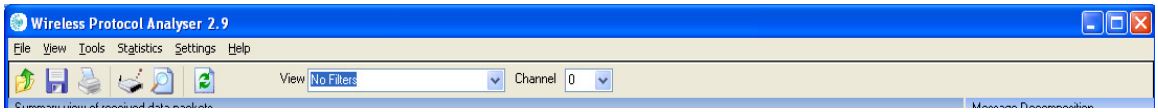
The menus bar gives you access to the main commands used in 802.15.4/ZigBee USB Dongle. The main menu follows conventions widely used in desktop software.

Menu bar

Menu name	Dropdown Links	Short Key	Description
File	Open	Alt+F+O	Open a previously saved data file
	Save As	Alt+F+A	Save the current packets session.
	Save Selected Packets	Alt+F+S	Save the selected packets from the current session.
	Export	Alt+F+E	Export of full or selected data packets in csv format to view e.g. in Excel.
	Auto Logging	Ctrl+L	For collecting data over a period of time.
	Print	Alt+F+P	Print the current session.
	Print Setup	Alt+F+U	Setup paper size, source, orientation, and margins and default printer.
	Clear Log	F4	Clears the current data log.
	Exit	Alt+F+X	Exit 802.15.4/ZigBee USB Dongle
View	Pause display	Ctrl+P	Freezes current screen display, continues to collect data packets.
	Manage Filters	F10	Provides the facility to setup customized data filters.
Tools	Channel Select Wizard	F6	Channel setting facility to select a known channel or search the network for available channels.
	Set Unit Details	Alt+F+D	Unit configuration facility to change a 802.15.4/ZigBee USB Dongle IP address and identity name.
Statistics	MAC Statistics		Breakdown of the number of packets of each type and frame sizes, and retransmission statistics.
	MWK Statistics		Analysis of ZigBee traffic
	MAC Node Statistics		As above, but for individual nodes
	NWK Node Statistics		As above, but for individual nodes.
Settings	Options	Alt+F+O	Allow you to save log files in a location of your choice.
Help	Contents	Alt+F+C	link to this User Manual (PDF format)
	About	Alt+F+A	Provides important details of your 802.15.4/ZigBee USB Dongle USB.

Toolbar

Immediately below the dropdown menu is the toolbar containing short cuts to 802.15.4/ZigBee USB Dongle commands.



Toolbar

Open data from previous session. To open an existing data file click on the Open tool or Choose Open from the file menu.

Save session to file: to save the data collected in a session, click on the Save tool or Choose save from the file menu. Select the location to save the file and give the file a file name.

Print details of packets. Click on the Print tool or Choose Print from the file Menu.

Scan for activity on networks. Click the Scan tool to commence scanning for data packets.

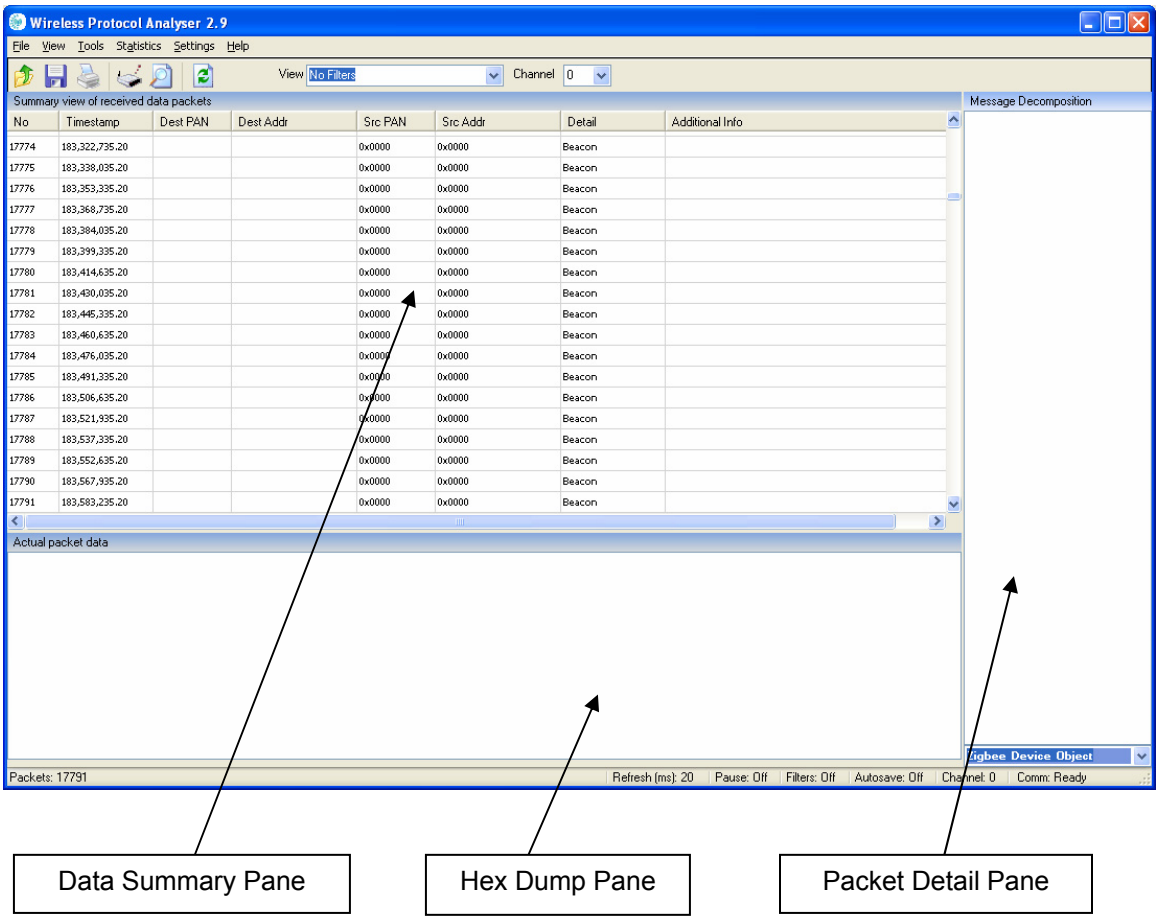
Manage Filters and Views. Opens a wizard to assist in creating views and filters.

Enable/disable the screen from automatic refreshing. Click the Enable/disable tool to freeze the display or allow automatic refresh of the data packets displayed.

View box allows you to select from either no filters or a range of filters, which may be setup and customized using the **View Manage Filters** menu wizard.

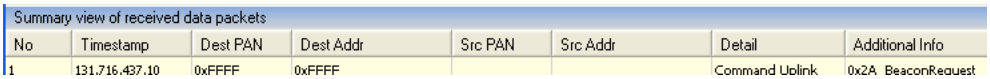
802.15.4/ZIGBEE USB DONGLE WINDOW

The 802.15.4/ZigBee USB Dongle window consist of three panes, these are:



Data Summary Pane

The Data summary Pane is the main interface pane displayed on the left hand side of the window and displays a continuous view of data packets sniffed and received.


Summary view of received data packets
No Timestamp Dest PAN Dest Addr Src PAN Src Addr Detail Additional Info
1 131.716.437.10 0xFFFF 0xFFFF Command Uplink 0x2A BeaconRequest

Data summary pane column headings view

There are eight data information columns within this pane. The data sniffed is displayed under each column heading, the table below provides brief explanations of the information contained within each column.

Data Summary Pane Columns:

No.	Line number
Timestamp	Time packet data sniffed from left to right: Seconds milliseconds microseconds micro second points
Dest PAN	Destination PAN (Personal Area Network)
Dest Addr	Destination Address
Src PAN	Source Address PAN (Personal Area Network)
Src Addr	Description of packet
Additional info	Interesting information from packet

In addition, the **Packets** tab above these data columns displays the number of packets received in the session.

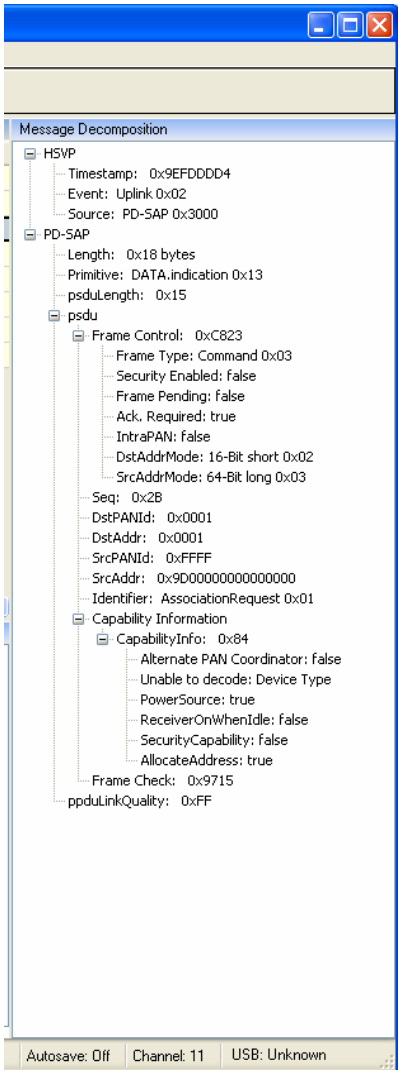
Packet Detail Pane

The Packet Detail Pane is displayed on the right-hand side of the window and displays a detailed view of data packets sniffed.

The example opposite shows packet details received whilst monitoring a transmission on channel 11.

The data packets details contained within the PD-SAP can be expanded using the + sign or collapsed using the – sign.

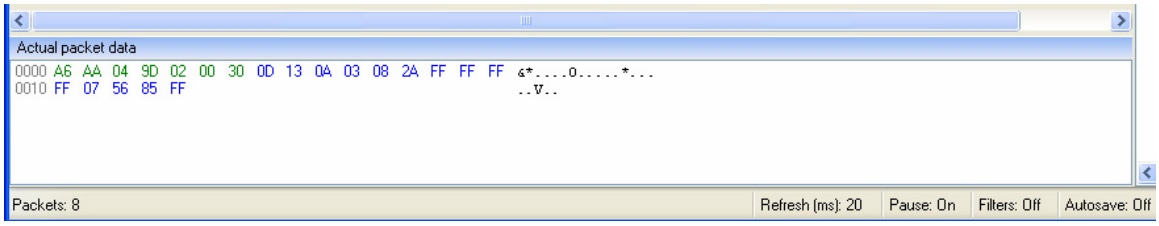
By clicking on any of the PD-SAP headings highlights the hexadecimal data displayed in the Hex Dump Pane.



Packet detail pane

Hex Dump Pane

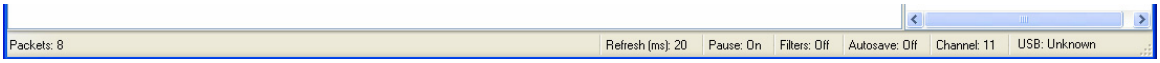
The Hex Dump Pane is displayed at the bottom of the window and displays a raw view of data packets sniffed.


Actual packet data
0000 A6 AA 04 9D 02 00 30 0D 13 0A 03 08 2A FF FF FF
0010 FF 07 56 85 FF
Packets: 8
Refresh (ms): 20
Pause: On
Filters: Off
Autosave: Off

Hex dump pane

NOTE:
The data shown here is in Hexadecimal.

Window Status Bar



Windows status bar

The windows status bar at the bottom of the screen display shows the current status of:

Packets:	Packet count, number of packets received.
Refresh (ms):	The screen refresh rate in milliseconds.
Pause:	Display status: ON: display is paused for viewing purposes. OFF: display is showing real time data being received.
Filter:	Status of filter selection; ON filters are selected. OFF no filters selected.
Auto save:	Status of auto save function; ON function selected. OFF function not selected.
Channel:	Channel being monitored.

4. PREFERENCES

Your 802.15.4/ZigBee USB Dongle software has provision to change settings in order to customize configuration and display presentation to meet your specific requirements.

MANAGE FILTERS

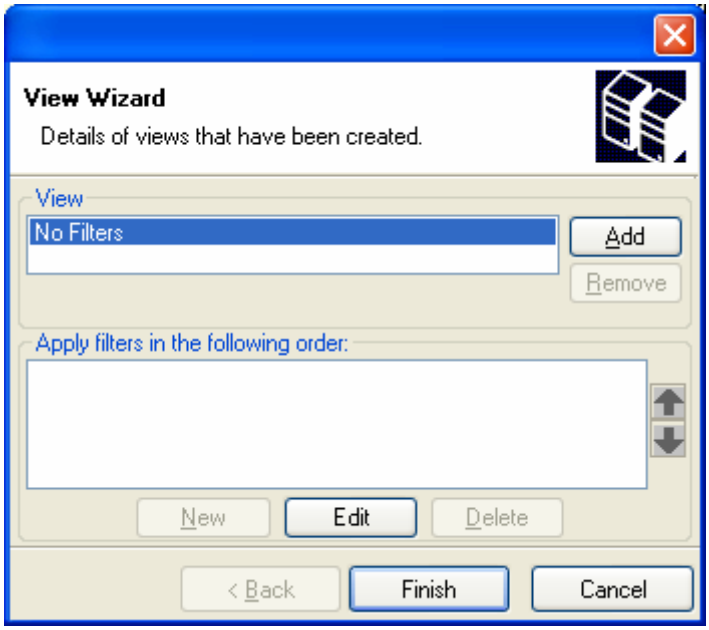
You may choose to add filters by using the View Wizard. The wizard enables you to add, setup and customize filters, which will be accessible from the window menu bar. To view current filters or to use the View Wizard click **View** | **Manage Filters...**or press the shortcut key **F10**.

You will now be presented with the View Wizard window opposite.

There are two panes within this window to select from, they are:

- View
- Apply filters in the following order

The View pane shows the default setting of No Filters.

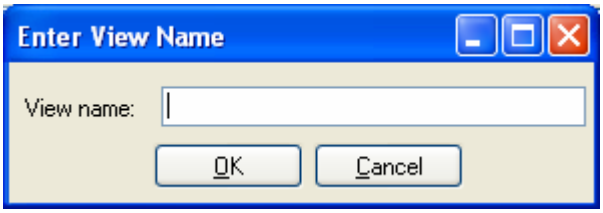


View Wizard

Viewing, Adding and Removing Filters

To create a new filter click on the **Add** button.

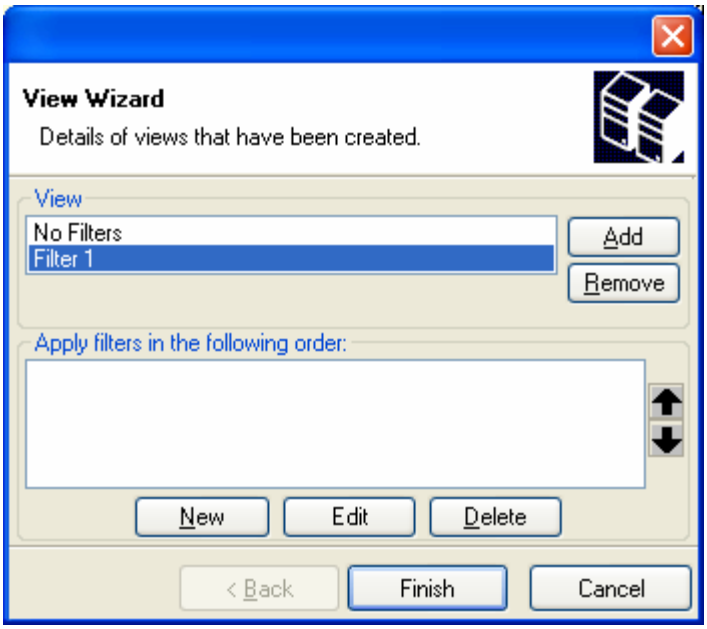
You will be presented with the "Enter View Name" window (shown opposite). Enter an identification name of your choice for the new filter in the box provided, then click OK.



View Wizard filter view name window

We have created a filter, named **Filter 1**, which can be seen in the View Wizard window shown opposite.

Having created “filter 1” we now need to define the filter rules.



View Wizard

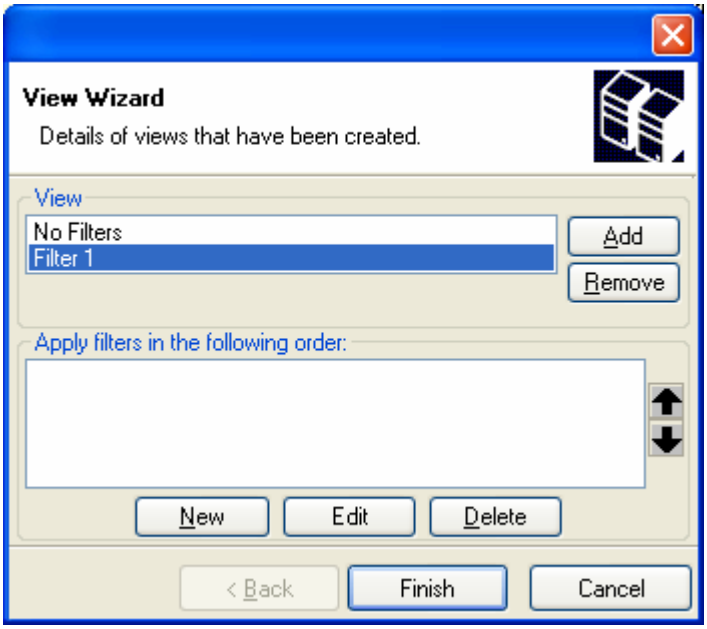
Applying Filter Rules

Select the filter to which you wish to add filter rules. In this example we have created a filter named Filter 1, click on **Filter 1** to select it.

Any filter rules previously defined would be displayed in the **Applying filters in the following order** pane. As filter 1 is a new filter no filter rules have been defined.

You may now select either New, Edit or Delete buttons:

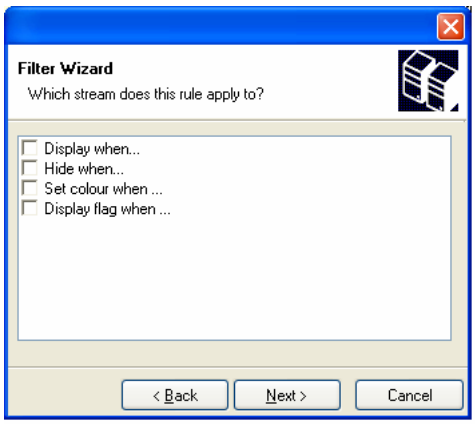
- New button: Will enable you to add new filter rules or remove existing rules.
- Edit button: Will enable you to edit the existing filter rules.
- Delete button: Will enable you delete the selected filter rule.



View Wizard

Click the **New** button.

The Filter Wizard will be displayed which provides four rule options as shown opposite.



Filter Wizard

The rule options are:

Display when..... : The data stream will be displayed in the 802.15.4/ZigBee USB Dongle Data Summary Pane when the rule is true.

Hide when..... : The data stream will not be displayed in the 802.15.4/ZigBee USB Dongle Data Summary Pane when the rule is true.

Set colour when..... : Option to set the displayed colour of a data stream in the 802.15.4/ZigBee USB Dongle Data Summary Pane when the rule is true.

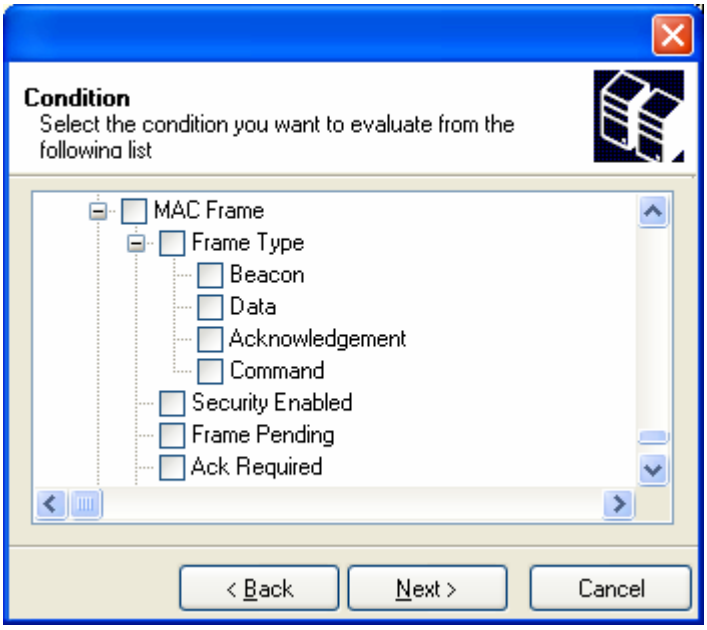
Display Flag when..... : Provides the option to set a flag on screen when a data stream in the 802.15.4/ZigBee USB Dongle data summary Pane meets the rule applied.

You may select the condition you want to evaluate by selecting from the list shown in the window opposite.

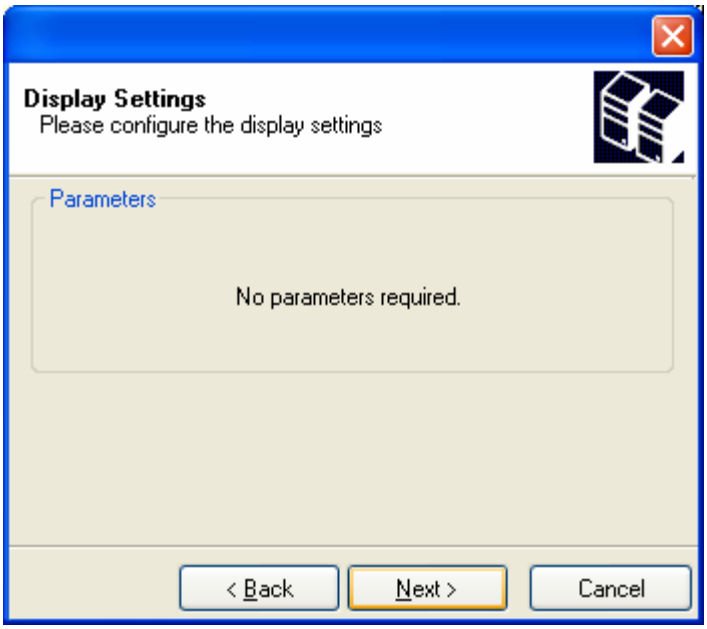
Clicking in any of the boxes selects the conditions you wish to evaluate.

NOTE: *Click on the + sign to expand a rule.*

Once you have made your condition(s) selection click the **Next** button.



The Display Settings window will be viewed, in the example opposite you only need to click the **Next** button to proceed.



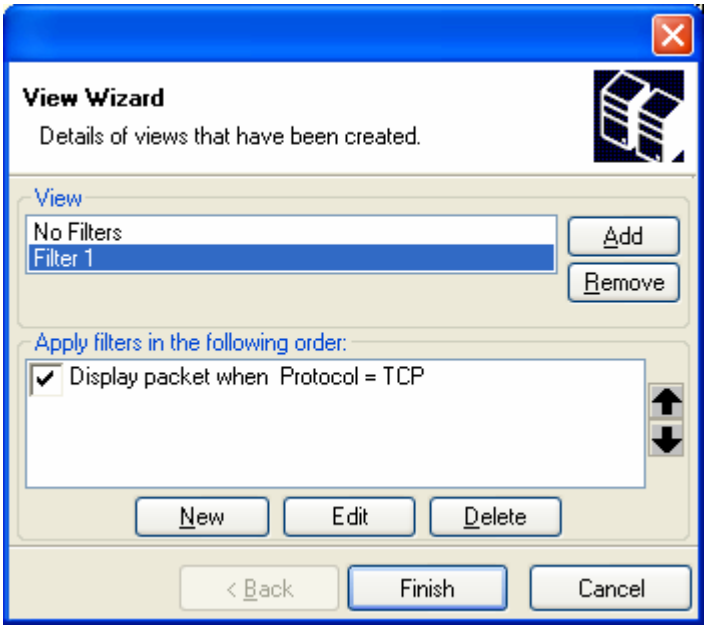
Filter Wizard Display Settings Window

You will then be returned to the View Wizard (shown opposite) which shows the filter rule(s) that are available to apply.

To apply a filter rule click the adjacent tick box.

Filter order is easily set by using the up down arrows.

When you have completed setting up and customising your filter options, click the **Finish** button.



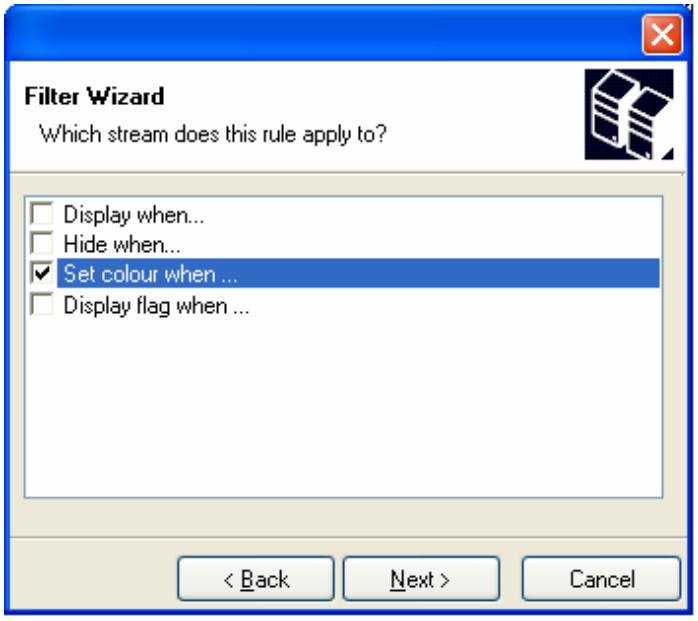
View Wizard

Setting Up Rule Colours

This option allows you to customize the colour of stream data rules displayed for ease of identification.

When you are in the Filter Wizard, click on the **Set colour when...** box as shown opposite.

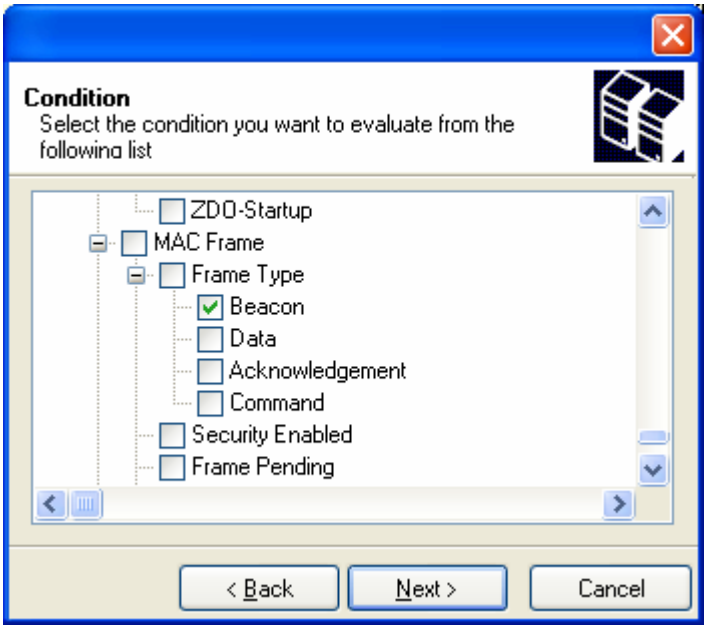
Then click the **Next** button.



Filter Wizard

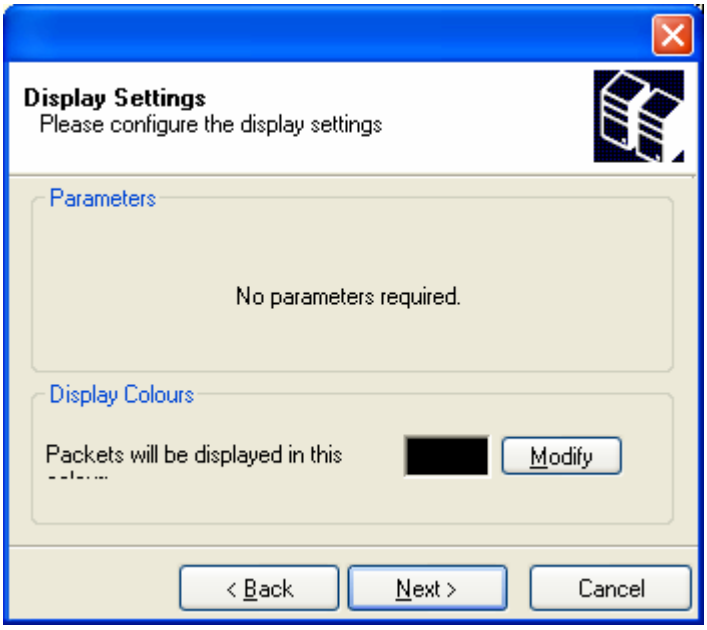
In the Conditions display in our example we have selected the **Frame Type: Beacon** box.

Then click the **Next** button.



Filter Wizard Condition Window

The Display Settings window will now be presented. This allows you to select the colour of the rule. To select the colour, click the **Modify** button.



Filter Wizard Display Settings Window

The colour window will be displayed, from which you may select the colour you wish the rule to be viewed.

Select your choice of colour by clicking on the colour box.

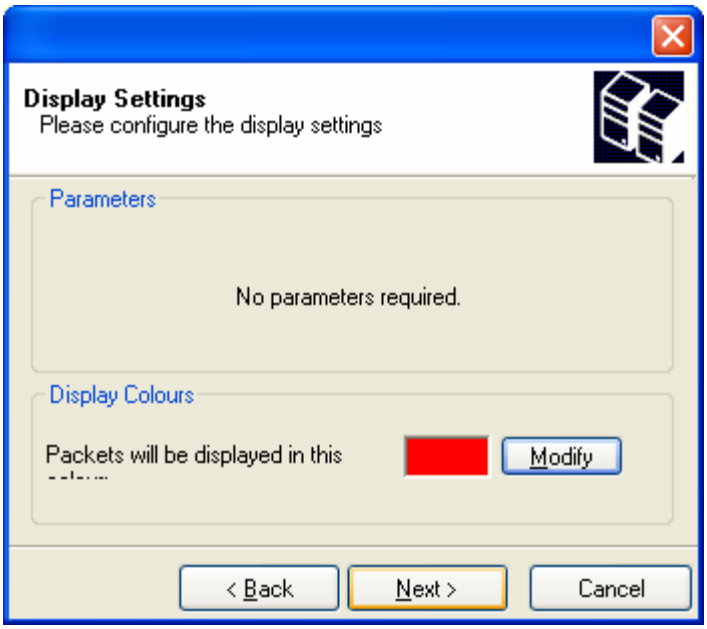
If you prefer an alternative colour you may click on **Define Custom Colours** to define your own customized colour.

Once you have made your selection, click **OK**.

Filter Wizard Color Window

In the example opposite Red was selected as the rule colour.

Click **Next** button to proceed.

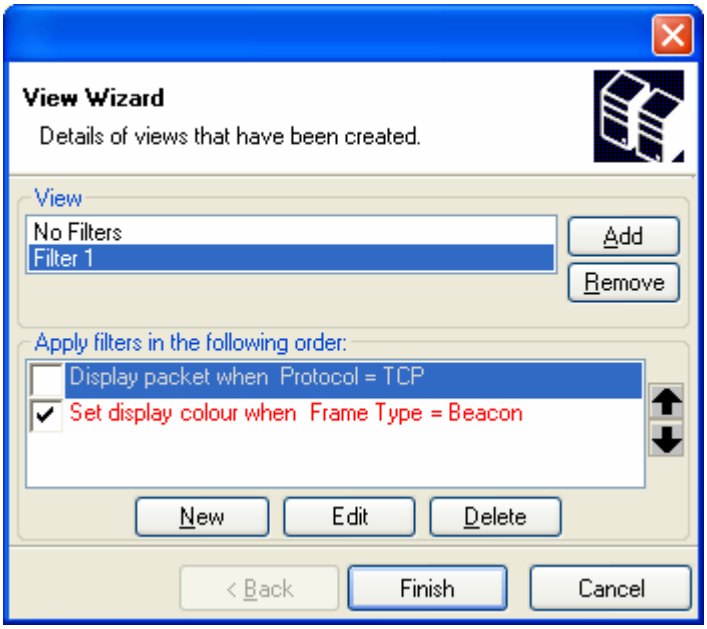


Filter Wizard Display Settings Window

You will be returned to the View Wizard window. In the example opposite a new filter was created as shown in the View pane.

The lower Apply filters pane shows the frame type Beacon has been selected to be displayed in Red.

Click **Finish** button to close.



View Wizard

Saving Log Files

To select the location where log files are to be stored, on the menu bar click **Settings** | **Options.**

The Configuration Options window (shown opposite) is displayed.

Click the **Browse** button to select the location to store log files.

Once you have selected the location click the **OK** button.

All captured data packets saved will be logged in the selected location.

Saving Selected Packets

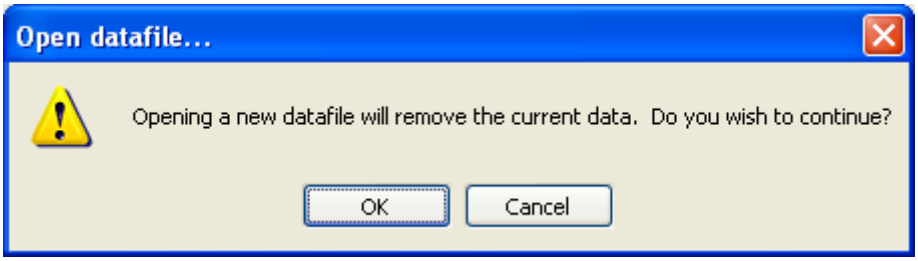
Instead of saving full data captured packets you may save selected data packets only. Using the Data Summary Pane you may select data packets by one of the following options:

- To save selected data packets, hold down the keyboard Ctrl key and with the mouse click on each of the displayed data packets you require to be saved.
- To save a sequential group of data packets, hold down the keyboard shift key, using the mouse click on the first data packet to be saved and then click the last data packet. Alternatively hold down the Ctrl key and press the keyboard up or down keys.

Viewing Saved Log Files

To view saved log files on the menu bar click **File** | **Open.** Alternatively click the toolbar button.

When you click Open or the toolbar button the warning window shown below will be displayed. This advises that you are about to lose the data currently in memory.



If you want to keep the current data capture session, or to save the captured data before proceeding to view a saved log file, click the **Cancel** button. To open a saved data file click the **OK** button, then select the appropriate file. 802.15.4/ZigBee USB Dongle data files have .cxs extensions.

5. MAINTENANCE

Your 802.15.4/ZigBee USB Dongle dongle requires the minimum of maintenance.

CARE AND CLEANING

Plastic surfaces are easily scratched and can be marred by alcohol and various

solvents. To keep your product clean, gently wipe with a soft clean lightly dampened cloth to dust this product, avoid excessive use of oil-based furniture polishes since the materials used in the dongle will accumulate more dust. A non-abrasive, anti-static cleaner/polisher is recommended.

6. TROUBLESHOOTING THE 802.15.4/ZIGBEE USB DONGLE

Please check to see if any problem you may have with your 802.15.4/ZigBee USB Dongle is described here before taking it for service or calling for support.

Problem	Possible Solution?
Q1. Power LED ON, not receiving data packets.	• Try an alternative USB port on the computer. • If connected to a stand alone USB Hub, try connecting the dongle directly to the computer's USB port. • Check the distance of the transmitter is within 10 metres of the dongle. • Check the dongle is not obscured by metal objects.
Q2. Application reports no device found	• Check on device manager that the IAI-DAUB1-2400 is installed correctly • If the device appears as "IAI-DAUB1-2400 Loader", then it is only half installed. Right click on the device and select 'update driver'. Follow the installation instructions as described above.

Should none of the above solutions rectify the problem, refer to the technical support section in this manual for further assistance.

UPGRADING/UPDATING THE 802.15.4/ZIGBEE USB DONGLE

Visit the Integration website for support information on updates for your 802.15.4/ZigBee USB Dongle, website address: www.integration.com.

7. TECHNICAL SUPPORT

CONTACTING TECHNICAL SUPPORT

If you contact us please be prepared to give us the following information:

- Complete name of product
- Version number on the CD-ROM, if any
- Specific details of the problem
- Complete information on your computer system setup

Worldwide

Email: wireless.support@integration.com

8. TECHNICAL SPECIFICATION

Features

- Real-time 802.15.4 packet ‘sniffer’
- Transmission Quality Measurement
- Sub microsecond message timestamp
- Graphical Protocol Analyser

General

Compliance

802.15.4 compliant, CE compliant,
USB 1.1 and 2.0 compatible.

9. GLOSSARY

Acknowledgement	802.15.4 Ackn. Packet
Ack required	Bit in 802.15.4 Mac header
Beacon	802.15.4 Transmission
Beacon Payload	Data transmitted along with a Beacon
Comms	Communications
Command	Type of 802.15.4 frame
Data	Type of 802.15.4 frame
Dongle	External hardware device
Frame Control	Part of 802.15.4 frame
Frame Check	Part of 802.15.4 frame
Frame pending	Part of 802.15.4 frame
Filters	Method of viewing and hiding data information from the display
Filter rules	Method of adding, and removing filtering using data information rules
Filter Wizard	Setting up of filter rules using on screen setup
Intra PAN	A Bit in a 15.4 frame
Dest PAN	Destination PAN (Personal Area Network)
Dest Addr	Destination Address
GTS Fields	Part of Beacon frame
Hex	Hex decimal code
Length	Length of 802.15.4 frame
No.	Packet ID number of sniffed data
Packet	Packet of data information
Pending Address Fields	Part of Beacon frame
Security enabled	Bit set in the frame
Srs Addr	Source Address
Srs PAN	Source Address
Superframe Specification	Defines 802.15.4 timing structure and is captured in the Beacon frame
Timestamp	Time packet data sniffed
USB	Universal Serial Bus

10. INDEX

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Integration Associates, Inc.
110 Pioneer Way, Unit L
Mountain View, California 94041
Tel: 650.969.4100
Fax: 650.969.4582
www.integration.com
info@integration.com
wireless.support@integration.com
IUK149

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